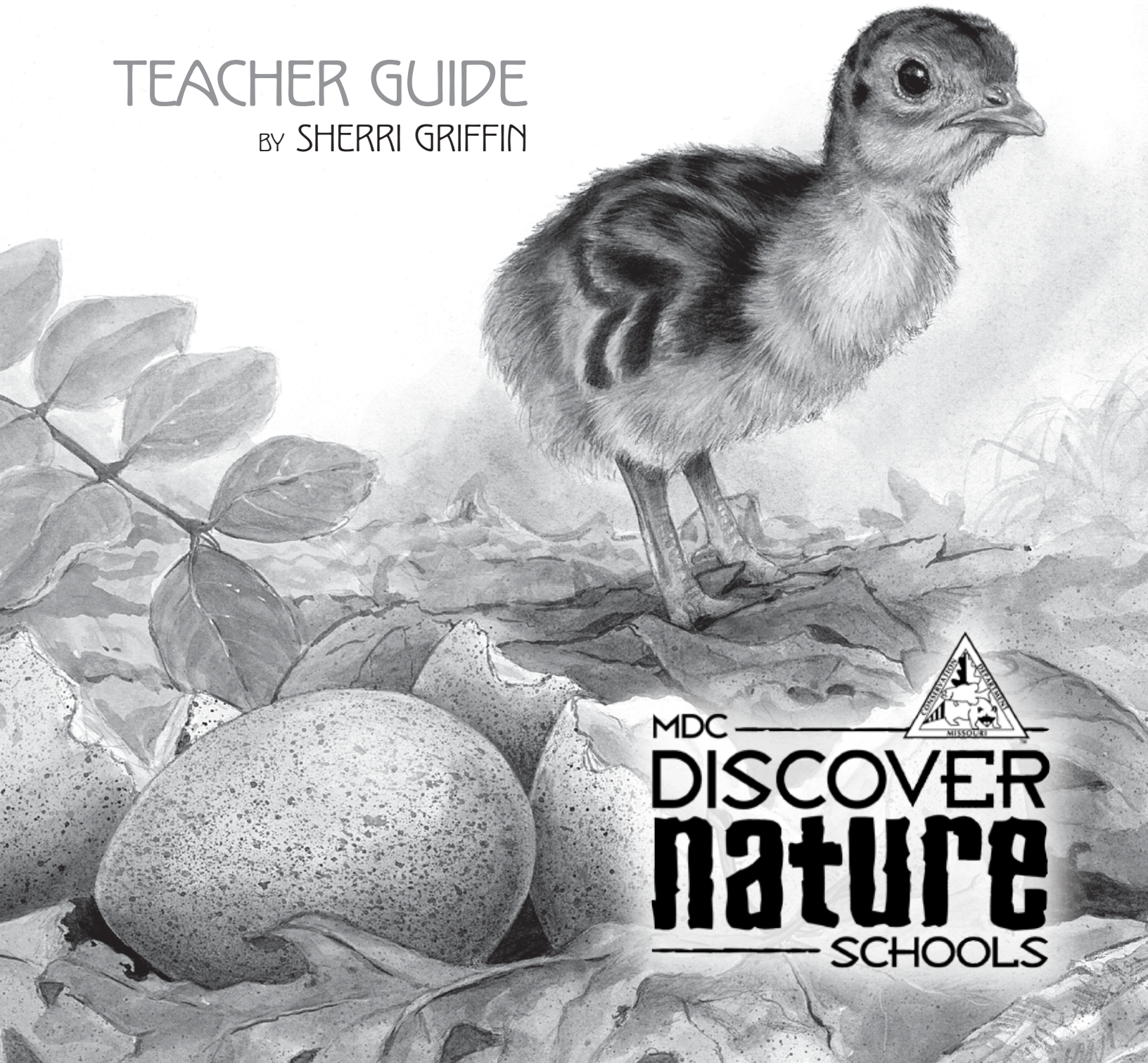
NATURE UNFOLDS

TEACHER GUIDE

BY SHERRI GRIFFIN



MDC DISCOVER nature SCHOOLS

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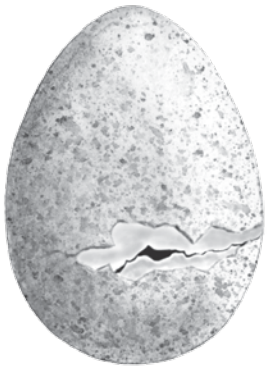

Missouri Department of Conservation

ABOUT THE AUTHOR

Sherri Griffin, Ph.D., is a professor of early childhood education at Central Methodist University in Fayette, Missouri. She also teaches and learns at Millersburg Preschool, Alumni School and Cedar Creek Club in Millersburg, Missouri. She presents workshops at local, state and national conferences on sharing nature and conservation with young children.

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ACKNOWLEDGMENTS

See How the Turkey Grows is an extension of a project started in 1983 when my husband, John, joined the Missouri Department of Conservation as a new conservation agent. At the time, the original *Conservation Seeds* curriculum was written, I was a young, inexperienced teacher working on my Ph.D. John was the connection who believed I could offer the Department insight into young children and how they grow, think and develop. Since then, I have presented numerous workshops and classes about sharing nature and conservation with children. Over the years, my thinking has changed as I learned along with the children. The path that I started so long ago has included many mentors, friends and inspirations along the way.

First, I need to extend appreciation to the many education consultants from the Missouri Department of Conservation who traveled beside me during various portions of this journey. They all worked diligently to teach me about nature and conservation. They listened indulgently to my stories over the years and endured patiently all of my many questions. Many visited preschool, alumni school and the creek and offered suggestions about presentations, classes and writings. Without their expertise, this writing would not have the conservation foundation that I have developed over the years.

My colleagues at Central Methodist also deserve a word of thanks. Janice Henson, Barbara Thurmon, Melissa Morrison and Nancy Hadfield have all provided suggestions, support and encouragement in numerous ways as I worked through the activities and rubrics included in these pages.

The children and families at Millersburg Preschool, Alumni School and Creek Club deserve thanks for being a testing ground and always ready for a new adventure. They welcome my action research and continue to inspire and foster my growth as a teacher, learner and player.

Current members of the Conservation Department deserve most of the credit for the finished piece you hold today. Mark Raithel was the artist who made John's turkey story jump off the page. Thank you for listening and making the ideas we talked about a reality. Marci Porter designed both the picture book and the teacher guide making them look so beautiful. Kevin Lohraff worked patiently with me and offered suggestions and support to work through ideas. Regina Knauer asked me to tackle this project and was my champion as we worked through the details.

Mrs. Merrill and her first graders at Madison school were the children I thought of most when writing these experiences. I want to thank them for allowing me to spend so much time in their classroom learning what it is like to be a first grader again.

Lastly, I want to thank my husband, John, for always supporting and assisting with my conservation related projects. I hope his stories serve to inspire learners for many years to come.

PURPOSE

"The conservation conscience must begin with the young, and there should be opportunity for its blooming." (Swift, 1967)

Conservation education comprises all activities and experiences which result in learning about our dependence upon and use or abuse of natural resources for our needs and wants. Activities and experiences should emphasize feelings rather than knowledge for the young child. Rachael Carson called it the "sense of wonder" and authored a book so-titled for parents and teachers of young children. Her immortal message encouraged us to make discovery fun and to stimulate children's natural sense of wonder. Later, when children are ready, they will assimilate the facts that correspond to personal feelings.

Nature study is the process of learning about nature, the key often used to generate interest in conservation. Children are intent on discovering the properties of nature. Too often we neglect to see their interest, spoken or silent—that "sense of wonder" that should be cultivated. Teaching any subject demands awareness of children's interests and explorations, picking up the cues, and guiding the children's discovery of reality. This is also true of conservation education.

Conservation education is more than nature study. It involves our use of all natural resources: air, water, minerals, land and all life forms, including people. The term "conservation" is of relatively recent origin, but references to conservation ideas and practices are not. The classic textbook definition of conservation is "the wise use of natural resources." Another definition that has much merit was stated by the renowned conservation philosopher Aldo Leopold who wrote, "Conservation is a state of harmony between men and the land." It is important to note, that in order to determine best use of natural resources, people have to have a basic understanding of nature and the intricacies of how ecosystems operate. Nature study is tied to understanding and practicing conservation.

Regardless of the definition used, it is important to realize that conservation is not a subject to be relegated to a certain hour of the school day but rather a philosophy of living that reflects a pattern of human behavior with respect to our life-sustaining environment.

When I first began teaching, I thought conservation meant saving the natural resource. Like many people, I assumed that to conserve a natural resource meant not using it. However, after studying and learning about conservation, I now understand that there are three levels of conservation effort: preservation, restoration and management (Missouri Department of Conservation, 1990).

PRESERVATION

Preservation means saving with little or no use of a resource. "There are certain resources—true wilderness, endangered species of plants and animals, small tracts of unique ecosystems, historically important buildings—in which preservation is the only possible method of conservation." (Missouri Department of Conservation, 1990, p. 2)

RESTORATION

Restoration is the second level of conservation. Of equal importance, restoration implies a long-term effort to reestablish the original quality which once existed in the resource being restored. This level of conservation may address the return of worn-out farmland to productivity, the restocking of a wildlife species to an area from which it had been depleted, the replanting of denuded forest land, the grading and seeding of barren strip-mined areas or the reflooding of a drained waterfowl marsh.

MANAGEMENT

Management is the third level of conservation. It is on the management level that people must make the decisions and implement practices. People often don't realize that the decisions they make about their backyards is a land management decision that impacts whole ecosystems. For example, I live on a gravel county road in a very small, rural community. Most of my neighbors live on five or more acres of land. Some have chosen to clear their acreage and plant and mow grass; some harvest hay, plant gardens or use the land for livestock; some plant warm season grasses and manage controlled burns on a regular basis, and still others let the land proceed as it would naturally. Each of these individuals, whether consciously or not, is making a decision about how to manage the natural resource and thus impacting the wildlife sharing the habitat.

While much of this seems beyond the understanding of young children, the attitudes they develop about the earth's natural resources begin at a very early age. Conservation is a philosophy of daily living that reflects

a pattern of people's behavior with respect to our life-sustaining environment. This philosophy extends to everyday decisions made on a daily basis in the classroom.

One such example in my classroom concerned one of the literacy experiences that children especially enjoy—character suitcases. The particular suitcase in question was based on the book *Nicky the Nature Detective*. Inside the suitcase was the book, a Nicky doll, binoculars, a compass, insect box, hand lens, blank book and colored pencils. Children sign up to take these suitcases home on a rotating basis. One child had taken Nicky home and kept forgetting to bring her back. After several weeks, the family wrote me a note saying they could no longer find all of the parts. A classroom discussion followed about how to handle the suitcase issue. I was amazed to find that all three levels of conservation were involved in this discussion. One child thought the suitcases shouldn't go home with anyone anymore; they should remain at school for children to use (preservation). Another thought the family should have to buy all new materials for the suitcase (restoration). Still another child thought the family should not get any more suitcases until they returned the lost materials (management). Although this discussion wasn't about natural resources or a topic considered relevant to conservation, it was about allocation of resources and was very conservation minded. The way problems are handled in the classroom provides children with strategies for how they handle problems in everyday life. Conservation ethic is taught whether teachers intend it or not.

As teachers, we have the power to influence that philosophy whether we want it or not. Only knowledgeable, well informed people can make decisions about best practices. As early childhood professionals, our responsibilities lie with helping children develop attitudes and gather information about the interdependence of natural resources and people. Conservation ethic decisions will belong to them in the future.

As a teacher, I have grown and matured in my handling of conservation issues and concepts throughout the years. When I first began thinking about conservation in my classroom, I considered it just another topic or study that we would engage in on an occasional basis. However, as time has gone by and I have read, studied, and lived the topic, I have come to realize that conservation ethic is addressed in life on a daily basis. It is not something that I decide to teach or not to teach. Conservation ethic is evident in every decision made by me, the children, and our classroom community. My ultimate goal for the children is not that they grow up to be preservationists or hunters but rather that they consider all sides and make decisions about conservation issues based upon a real understanding of ecosystems and how they work. Only then will they be able to handle the "wise use" of our world's natural resources.

DISCOVER NATURE SCHOOLS

"What's the relationship between School and Mother Nature? Are they getting divorced or are they committed to working on a long-term relationship?" (David Sobel, 2008).

Discover Nature Schools (DNS) is designed as a commitment to a deep and sustained relationship between Missouri schools and the out of doors. The Missouri Department of Conservation has long provided teachers in the state with materials to aid in teaching learners of all ages about nature and conservation. In recent years with the pressures of high stakes testing and No Child Left Behind, it has become increasingly more challenging for teachers to devote time, energy and resources to taking children outside. Yet research indicates (Louv, 2005; World Forum, 2008) the importance and absolute necessity of sharing nature and the out of doors with all children on a routine basis.

Nature Unfolds is the primary grade level unit of DNS. Activities in this teacher guide address Missouri Department of Elementary and Secondary Education (DESE) Grade Level Expectations (GLEs). First grade Living Organisms, Ecology and Earth Systems GLEs are targeted, but there are also GLEs addressed from kindergarten and second grade. The activities in the teacher guide, along with the picture book, are designed to last throughout the school year, encouraging teachers to experience the environment ***with*** the children rather than merely discussing or pointing out vague ideas.

UNIT OVERVIEW

The children's picture book, *See How the Turkey Grows*, is written with the young learner in mind. Rather than a textbook presenting facts, this realistic fiction picture book is designed for discoveries and connections to be made by children as their understanding of concepts unfolds. The intent is to revisit this text numerous times throughout the school year while exploring activities in the teacher guide. Classroom copies of the picture book are provided so each child has the opportunity to see, experience and live the many aspects of nature addressed in the text and illustrations. It is presented in such a way to inspire the young learner's "sense of wonder" while capitalizing on the concepts of nature, conservation and science that the GLEs dictate children know.

The companion teacher guide is intended to offer experiences that will escort children toward greater understanding of the academic content of the GLEs throughout the school year. This guide is presented in a seasonal format, with each season building upon concepts introduced and expanded upon in the previous season. It begins with summer and continues throughout the school year into late spring. Although the GLEs offer the framework around which the teacher guide is organized, the learning experiences presented are designed with the young learner in mind, capitalizing on the child's interests and experiences while carefully considering developmentally appropriate practice (Bredekamp & Copple, 2009). Rather than rote learning of academic skills, the activities deliberately offer opportunities for active, experiential learning in a meaningful context. Supporting technology references are intentionally not included. Children this age need to be connected to actual experiences in a familiar environment (Sobel, 2008). (Keep in mind that rain gauges, thermometers and rulers are examples of technology and that by using tools such as string or ribbon to measure the wind, children are engaged in using and creating technology as well as engaged in elements of engineering.) This approach will assist the young learner in not only acquiring the academic facts identified in the GLEs but also the ability to apply the information to problems and real situations. This is also the reason the learners are referred to as children rather than students throughout the materials. They are individuals and children before they are students in our classrooms. It is imperative that we keep this foremost in our thinking if we want to successfully offer meaningful learning experiences that truly leave no child behind.

LEARNING EXPERIENCE COMPONENTS

Name of Learning Experience—The title concisely describes the activity providing clues as to what the learning experience entails. A quick glance identifies the key concepts or topic addressed in the activity.

Objectives—These are specific, observable actions that learners will engage in during the learning experience.

Grade Level Expectations—This section includes the specific Missouri Science GLEs that the learning experience addresses. If the entire intent of the GLE is not addressed, the portions not included are struck through. Although the Science GLEs are the only ones identified in this guide, keep in mind that curriculum frequently overlaps, and GLEs from other content areas could be addressed with the same activities. The following words reflect meaningful substitutions included in this unit:

- *Fox* is substituted for *dog*.
- *Turkey* is substituted for *chicken*.
- *Trees* are sometimes substituted for *plants*.

Materials—Each learning activity includes a comprehensive list of materials needed to complete the experience. They are written in a list format for check off as materials are gathered. Some of the learning experiences require the use of natural materials such as feathers. Any materials of this nature should be legally obtained—either purchased from a reputable source or taken from game birds legally harvested during season. Hunters generally are very willing to share the turkey, duck and other game bird feathers for educational purposes. Feathers, nests, eggs, etc. found by the teacher or children during outdoor experiences should be observed but then left where they were found.

Teacher Preparation—Included in this section are activities that teachers need to do prior to sharing the learning experience with the children. It is also written as a checklist for teachers to quickly ascertain if they are adequately prepared to present the learning event.

This icon indicates book(s) from the Children's Literature section especially relevant to an activity and found by season/activity in the annotated "Children's Literature Recommended in Activities" section which begins on page 199.

Procedure—The numbered step-by-step procedures are specific and designed for both the novice as well as experienced teacher. This includes how to introduce the experience, background information for the teacher, step-by-step instructions for conducting the experience and a conclusion to the learning event.

Questions For Discussion—Each learning event includes several open-ended questions that encourage children to make deeper connections and explore beyond the activity itself, often integrating concepts across the curriculum.

Assessment—The assessment rubric is a detailed plan to evaluate how each child met each of the objectives and GLEs identified. Included here are specific, observable behaviors or artifact details that indicate how successfully the objectives and standards have been dealt with. They are designed to assess individual understanding as well as judge the success of the experience itself. These rubrics are intended to assist the teacher in evaluating teaching and individual learning.

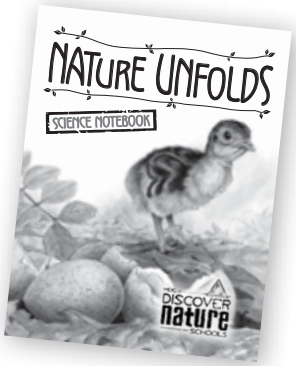
Learning Center Activities—This section includes supplemental learning experiences that address various subject areas and support or expand upon learning in the main experience. While these experiences are not essential to understanding, they will support the growth and application of the knowledge gained during the main learning experience.

Science Notebook Pages—These are specifically tailored to each learning experience. These pages should be copied and used during the activity. They might be placed on a clipboard (to be added to a science folder or notebook later) or put into a specific science notebook (folder) before the activity is presented. As you consider how to use these notebook pages, it is important to consider your own teaching style as well as the children within your classroom. Would these notebook pages be best organized in individual folders around a particular topic (for example weather) or should they be placed in a folder for the appropriate season? Whichever organization you select, the science notebook pages should be used as a teaching as well as an assessment tool. They also serve as documentation of the children's learning and growth throughout the year.

Student Science Notebooks—Science notebook pages included in this teacher guide and discussed above have been compiled into individual student science notebooks. In addition to the science notebook pages from the teacher guide, several generic notebook pages have been included in these student science notebooks to allow students to record information, make notes and sketch during other outdoor explorations.

These student science notebooks are offered as an option to printing science notebook pages from the teacher guide and distributing them to students.

Student science notebooks may be requested when ordering student books (*See How the Turkey Grows*).



SHARING LEARNING EVENTS WITH CHILDREN

"The best teachers are the ones who can remember what it was like to be a child." (Piaget?)

Teacher attitude and approach are as important as the activities themselves in sharing the learning experiences presented in the *Nature Unfolds* teacher guide. In his book *Childhood and Nature: Design Principles for Educators*, David Sobel (2008) identifies seven childhood "play motifs" (p. 20). He uses these play motifs to construct design principles for helping children build relationships with nature.

These principles along with knowledge of developmentally appropriate practice for six- to eight-year olds were used to structure the experiences presented in this guide. They are presented here because not only is it important for teachers to share these experiences with children in their classrooms, but also the attitude and tone in which the activities are presented will also influence the success of the learning experience for both the learner and the teacher. Recognizing and using these design principles will help you shape the experiences to your group of children. They also give you permission to explore the unknown and experience the joy of learning along with your children while keeping in mind the outcomes dictated by the GLEs.

ADVENTURE

The first principle Sobel identifies is ***Adventure*** (2008, p. 21). Adventure involves risk taking and exploration of the unknown—of surprises. I routinely visit a creek with the children and families in the local preschool where I teach. I find that the children are much more responsive when we go adventuring to the creek than when I call it a hike or walk, especially when the weather is wet and/or cold. Often the water is too high for wading, so our explorations are along a trail next to the creek. There are a number of large trees that have fallen in recent years. These "jungle gym trees" have the feel of the jungle, with grapevines hanging all around and the creek flowing by in front of them. They provide many opportunities for risk taking and adventure. The children challenge their physical prowess as they climb and balance on these large trees. Also provided here is the perfect backdrop for sitting and sketching our finds. Often we don't walk back along the trail but instead scale the mountain back to our picnic area. It is really a very steep hill, but scaling a mountain sounds and feels so much more adventuresome than walking back. These are really sidelines to my main purpose of exploring nature along the creek, but taking a moment to remember to make this hike more playful piques everyone's interest including my own! Remember to set the stage for adventure as you explore the experiences with the children. Adopting a mere change in the language and tone of voice used to introduce an experience to the children can make the learning fun as well as purposeful.

FANTASY AND IMAGINATION

Fantasy and Imagination is Sobel's second principle (2008, p. 24). This principle involves engaging the child's imagination and encouraging him or her to "live the challenge" rather than merely hearing a lecture about it. Last winter when my first grade niece and her fourth and fifth grade brothers were staying with me, we adventured in the woods and snow on a daily basis. One of their most memorable experiences was "getting lost" in the woods. We were hiking in an area of the woods they had not visited before. I pointed out the direction to the house and then walked out to the road and left them to find their way home. Their sense of adventure was piqued, and they became explorers forging new territory. They talked about and asked that this experience be repeated for months afterward. It was also the fodder for stories, writings and map making when we returned to the house and also when they returned to school following the holiday break. Use the experiences in this guide to create worlds for the children to imagine and explore while also accomplishing the tasks designated in the GLEs. The GLEs are there to guide our teaching and ensure a certain level of knowledge—not to make learning drudgery. Engage your imagination as well as that of the children's and everyone will remember the material you want them to learn.

ANIMAL ALLIES

Sobel's third principle is ***Animal Allies*** (2008, p. 29). "Animals play a significant role in the evolutions of children's care about the natural world and in their own emotional development" (Sobel, 2008, p. 29). The best way to understand something is to become that thing—to live, breathe and play as the animal or plant. Within the activities presented in this guide, you will find activities that assist you in helping children to experience animal allies. Being that young turkey emerging from the egg, following momma turkey through the weeds and hiding from predators capitalizes on the young child's learning about the turkey. The young child will be much more inclined to remember the life cycle of the turkey for the standardized test through this type of experience rather than just reading about it. Furthermore, after experiencing this, the idea of habitat becomes real for them. Only after many of these types of experiences can children really grasp the plant or animal's role in the ecosystem. We can't ask children to save the world until they really know it!

MAPS AND PATHS

Principle four is ***Maps and Paths***. Sobel describes this principle as "finding shortcuts, figuring out what's around the next bend, following a map to a secret event. Children have an inborn desire to explore local geographies. Developing a local sense of place leads organically to a bioregional sense of place and hopefully to biospheric consciousness" (2008, p. 34). Throughout my many years of teaching young children, I have found that they naturally find maps intriguing. Maps are something we use throughout our lives to help us figure out where we are both literally and figuratively. Mapmaking helps children develop a "sense of place" (Sobel, 1998). Recently, one of my kindergarteners in Alumni School brought two snakes and a turtle to share. In preparation for sharing his finds, he created a map of his house and yard showing exactly where he found each. The map helped the rest of the group consider why these animals were in these particular locations. There was much discussion about what the animals needed to survive and what was in the area. His map helped the rest of the group really understand and consider his home and how he shares it with the animals. There are several activities in this teacher guide that suggest mapping with children. The maps the children create will challenge them to consider their space in new ways and allow adults to see what is important to them and how they view their immediate environment. It will push them to symbolize the internal maps they have of their familiar spaces. Sobel calls maps "a tool for hitching children's live to their places" (1998, p. 9).

SPECIAL PLACES

Special Places is Sobel's fifth principle (2008, p. 38). Children have an innate desire to find and create special places. For the youngest children, this might be building a house from the couch cushions in the living room while older children move farther afield. In *Bridge to Terabithia* (Paterson, 1987) Jess and Leslie create an entire kingdom in the woods near their houses where they retreat to play, be alone and come to grips with the many puzzling aspects of the adult world. Children create these special places with or without adult assistance. As teachers, why not capitalize on this and work with the children to create special places on the school yard? Sobel (2008) describes several New England teachers who create classroom special places on their play yards and allow children to create their own places within that framework. They visit these special places recurrently throughout the school year for quiet work such as reading, writing and reflecting. These teachers report that the children often identify this as what they liked best in the curriculum. "Through recognizing children's deep impulses and building on them, the curriculum can be enhanced" (Sobel, 2008, p. 41). Many of the learning events in this teacher guide require being outside to complete them. Children will find their special places on your play yard, but if you make a conscious effort to address and use these as part of the curriculum, the learning experiences will provide even stronger connections for both you and the children.

SMALL WORLDS

Sobel's fifth principle is ***Small Worlds*** (2008, p. 45). Children love to create and play in miniature worlds. Playing in these worlds allows players to see and understand the larger picture. "It's like the one-page organizational chart for the organization, the site map for the website, the logic model that describes the underlying assumptions for a project" (Sobel, 2008, p. 46). The trail we use to access the creek is the old wagon crossing for the creek. It is still marked on the deed to the property. The path is wide with a rocky ledge along one side. Along this ledge are many rocky nooks and crannies. They cry out to be homes to magical creatures. One of these nooks was

designated by the children as a leprechaun house many years ago. It is a routine stop on our treks down to the creek. Over the years, the leprechaun sometimes leaves notes and treasure for the children to find. Inside the house, he stores his gold (a small pile of fool's gold) and his hat. The hat routinely is moved around by the leprechaun or some of his "friends"—the raccoons or birds in the area. Several years ago the hat completely disappeared. The children speculated that the leprechaun must have taken it back to Ireland. It was a great surprise (to the children but especially to the grown-ups) when the hat reappeared on an exploration several years later. The exploration of this rocky area has led the children to believe that all of the nooks and crannies are homes to leprechauns and fairies. They explore this miniature world looking for signs of residence as well as discovering much about the local flora and fauna. Mosses are left intact as fairy beds and pillows, and shells are added for fairy bathtubs. This magical place inspires respect and consideration for the place by not disturbing the inhabitants, always returning the rocks to where they were found and leaving nothing behind that isn't already part of the environment.

HUNTING AND GATHERING

The seventh and final principle identified by Sobel is ***Hunting and Gathering*** (2008, p. 50). He describes hunting and gathering as an innate characteristic of being human. It is part of our survival instincts. He suggests that teachers follow these instinctual predispositions and use them as a structure for learning experiences that will foster a positive relationship between children and the natural world. Children routinely make collections of artifacts they find—rocks, shells, sticks, flowers. Using this instinct to hunt and gather provides a basis for several of the experiences suggested in this teacher guide. These collections provide opportunities for the young child to sort, classify and create connections, which is the way individuals learn.

In addition, Sobel addresses the idea of hunting and gathering figuratively—"the quest, the search for the elusive" (2008, p. 55). During our routine visits to the creek, hunting for creek treasures is a primary focus of our event. No one knows (including me) what we will find along the way. The lure of the unexpected and the treasure we find if we look closely drives us to study the details of our environment. Transforming learning experiences into treasure hunts entices even the most reluctant learner to engage.

One drizzly, wet trip to the creek, we stumbled upon a newborn fawn in the grass right next to the trail. It took sharp eyes to spot it in the tall grass and much restraint to watch from afar. However, not many of those children will forget the treasure we came upon that day. When we returned to the classroom, research about the fawn revealed that it had not be abandoned like the children thought but that the mother purposely stays away so her scent doesn't attract predators to the baby. We also discovered that the fawn weighed about the same or less than the children's pet cats. The research we did as follow up taught all of us more about the deer with whom we share a habitat as well as how to research to find answers to our questions. Sobel states, "Treasure hunts with elementary students provide a concrete illustration of the process of doing research and probing into the hidden recesses of a subject that happens in secondary school and in professional lives" (2008, p. 55).

An underlying concept that Sobel ties to all of these principles is to assist children in learning about their own immediate environment before exposing them to the problems of the world. Developmentally, the young child isn't ready to process abstract thinking about places they know little about. It is difficult enough for adults to consider habitats they have never experienced, but for the young child it is nearly impossible to consider. Sobel promotes helping children love and feel comfortable in their own immediate natural environments. If we foster this at a young age, knowledge and the ability to make "wise use" decisions will come later. "If we prematurely ask children to deal with problems beyond their understanding and control, prematurely recruit them to solve the mammoth problems of an adult world, then I think we cut them off from the possible sources of their strength" (Sobel, 1996, p. 5). The experiences offered in *Nature Unfolds* encourage local learning while addressing science GLEs. They are meant to provide a framework for understanding and growth as well as a foundation for later responsible and ethical decision making.

TAKING ACTIVITIES OUTSIDE

"If a child is to keep alive his inborn sense of wonder...he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in." (Carson, 1956)

Most learning experiences in *Nature Unfolds* are designed to be implemented outside in the school yard. Familiarize yourself with the outdoor area, making note of dangerous places to be avoided. Each time you plan to take children outside, look at the area with the objectives of the learning experience in mind. Try to anticipate what the children will find and what dangers they might encounter. Preparedness will assist you in guiding the children toward discoveries you want them to make and facilitate their learning.

APPROPRIATE ATTIRE

Make sure children are appropriately attired for the type of exploration in which you plan to engage. Consider and anticipate the weather. Socks, comfortable shoes and long pants will help to avoid problems during the outing. During the winter, keep extra gloves and hats on hand for those children who come to school unprepared. Of course, weather extremes should be avoided, but much can be learned through observations following or during a light rain or snow storm. The day we discovered the newborn fawn was a wet, dreary day. We nearly cancelled this visit to the creek, but since the weather forecast did not include thunderstorms, we followed the routine. Think of the magical learning experience we would have missed if we would not have gone to the creek that day!

APPROPRIATE TOOLS

Take along the appropriate tools for the learning experience. Gathering materials for the experience prior to preparing the children will help make the most of the outside time. Even when just going outside the school, grabbing a first aid kit with basic supplies can save a trip inside before the group has completed the current learning experience.

As Rachel Carson (1956) so wisely advised us, young children have an *inborn sense of wonder*. Playing to that strength rather than concentrating on knowledge acquisition is important. As adults, we have often lost that sense of wonder or are afraid of exploring or studying something we know little about. **Don't be afraid to explore unfamiliar phenomena**. It's important that adults have opportunities to keep that *inborn sense of wonder* alive. Some of the most interesting and successful studies I have had with children were when I was able to learn along with them. I will never forget our discovery of the small crayfish under the mother's tail; or that ticks have eight legs and are arachnids rather than insects; or the egg sack being dragged behind a wolf spider would soon hatch hundreds of small spiders that she would carry on her back. These were all discoveries we made together, and I'm certain my delight and wonder was evident to the children as theirs was to me!

EXPLORATIONS

Encourage children to be observant. Many of the learning experiences offered encourage children to explore with all of their senses. Model observing, sketching and recording data about phenomena as you move through the area with the children. If you don't consider yourself an artist and scientist, the children won't think that of themselves either. Ask direct questions that will help children focus and challenge them to think. Bring the observation to the child's developmental level. For example, make comments regarding color, size, shape, texture or smell rather than providing factual information.

TEACHABLE MOMENTS

Take advantage of teachable moments. These are times when a child or a group of children have expressed an interest in something or when a phenomenon unexpectedly presents itself. Seize the opportunity and expand upon the expressed interest—it may not be there when you are ready to do a unit on it. A study that I initiate won't be nearly as successful or as valuable as what occurs by taking advantage of the *teachable* and learnable moment. All individuals learn best when they are interested in the topic being explored. Following the children's lead promotes learning experiences where everyone is actively involved in the learning, including the teacher.

COLLECTIONS

Encourage children to look with their eyes rather than disturbing areas and collecting specimens. After they have been examined, remember to return leaf litter and rotting logs to where they were found.

However, collecting artifacts and taking them back to the classroom is a wonderful way to extend the outdoor experience. Many of the learning experiences included in the teacher guide suggest collecting specific artifacts for sharing back in the classroom. The following guidelines should be addressed when promoting collection as part of the learning experience.

1. Discuss safe and specific items to collect. Often children are very zealous in their collection process. They neglect to consider safety. Be sure to discuss what the children are collecting and how to make sure it is something safe before beginning the activity.

2. Respect the area and all area regulations. If you are exploring a locale beyond your school yard, read and follow the rules of the area. Caution the children about only taking what they need for your specific purpose. The rest should be left behind for other users of the habitat to enjoy. Discuss "wise use" of the natural resource and the impact the children might have on the area. For example, when children collect seeds or nuts, collecting all of the acorns they can find might deprive the local wildlife of a food source or when collecting flowers, picking everything in sight ruins the beauty for the next visitors.

3. Consider alternative methods of collection. Collecting artifacts doesn't always mean physically removing the item. Photographs and sketches are obvious possibilities, but audio recordings of sounds can also be a valuable reminder of the experience for children. Listening to these tapes back in the classroom often allows children (and teachers) to notice details missed while in the area.

4. Live plant and animal specimens should not be collected. Creatures encountered during an outdoor learning event should be observed in the natural habitat, then released immediately. Tadpoles should be observed in a natural habitat rather than taken back to the classroom to be studied. Plants and animals held in captivity can be exposed to harmful diseases, viruses and fungi that might be transferred to wild native species. As an alternative, consider building animal habitat (for example a small pond) in your play yard that will attract the animals (frogs) or foster the plants you want to share with the children.

5. DO NOT release purchased tadpoles, insects or plants into the wild. Many of these purchased species are not native to Missouri and can create difficulties for native species, disrupting local ecosystems. The *Missouri Wildlife Code* even specifically prohibits some species that can be purchased out of state. Several invasive species around the country have been traced back to school project releases. If you purchase plants or animals to observe and study in the classroom—even those native to Missouri—dispose of them in a humane manner (humane euthanasia for animals or in a plastic bag deposited in the trash for plants).

6. Feathers are wonderful artifacts to study and use in the classroom. All feathers found outdoors may be examined and left where they were found. However, laws regulate the possession of feathers from certain birds. The Migratory Bird Treaty Act (MBTA) of 1918 establishes a prohibition on the possession, purchase, sale, transport, etc., of any migratory bird and includes prohibition on any bird part, nest or egg of any such bird. To legally possess feathers of birds protected by MBTA, contact a conservation agent of the Missouri Department of Conservation for assistance with obtaining the federal educational use permit which must remain with the specimen. Feathers and other parts (except meat) from legally-obtained game birds may be legally possessed without permit. Other bird species, including house sparrow, European starling, and rock pigeon, are not protected under MBTA or state law and feathers from these birds may be legally possessed without permit. Also, feathers from farm-raised birds may be legally possessed as well as those purchased from classroom supply or hobby retail sources.

7. Poison ivy is common throughout the state. Learn to recognize it. I keep a set of leaves I laminated to help the children and me remember exactly what this plant looks like.

The foliage always turns a brilliant red in the fall, enticing young hands to pick it during collection trips. Find the plant at the beginning of the experience and show it to the children. Repeat the identification often. We have a resident patch on the path down to the creek that we visit on each trip to the area. I teach my children the following song to the tune of *Yankee Doodle,* and we sing it periodically throughout our outdoor adventures:

Poison ivy has three leaves.
White berries grow upon it.
It is food for birds and deer, but
    people should not get near.
Poison ivy leaves of three.
Poison ivy let it be.
Bush or vine do not touch it
Unless you want to <u>itch, itch, itch</u>!

The song helps children remember what to look for but also encourages them to see the purpose poison ivy serves in nature.

Always leave the area cleaner than you found it. Take along a trash bag to pick up trash even when this isn't your goal for the outdoor learning experience. You are modeling responsibility and caring for the environment.

Wondering about nature and conservation with the children over the years has taught me a great deal about teaching and learning. I am a teacher because I love learning. The children are my guides and teachers. Listen, learn, play and live with the children, and they will guide you to places you never dreamed. Ultimately, I would change Rachel Carson's quote to say "If a [grown-up] is to keep alive [his/her] inborn sense of wonder…[he/she] needs the companionship of at least one [child] who can share it, [discovering] with [him/her] the joy, excitement, and mystery of the world we live in."

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SUMMER

GROWING FLOWERS FROM SEEDS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Brainstorm things children need to grow, develop and learn in school
- Brainstorm things plants need to survive
- Investigate results of altering growth conditions
- Observe their own flowers grow and develop throughout the school year

GLES ADDRESSED

LO.1.A.1.b Identify the basic needs of most plants (i.e., air, water, light)
ME.2.C.1.a Identify light from the sun as a basic need of most plants
LO.1.A.1.c ~~Predict and~~ investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water)

MATERIALS

- Small paper cups or containers for individual plants
- Soil
- Flower seeds (dwarf marigold, zinnia, nasturtium, petunia or other quick-growing flower seeds)
- Chart paper
- Marker
- Science notebook pages
- Pencils

TEACHER PREPARATION

- Choose one of the types of flower seeds suggested above
- Plan for one cup/plant per child
- Plant at least 6 extra plants to use in experiments
- Mark individual plants with children's names after children have prepared them
- Determine if the plants will be taken home with children or kept in the classroom. If sending home, prepare note for families with purpose of plant activity and directions for care. Possibly even include a notebook to chart weekly progress of plant growth.
- Gather other supplies
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children on the first day of school and talk about what the children will need in their classroom to help them develop throughout this school year. Make a list on the chart paper.
2. Provide each child with one paper cup, at least 3–4 seeds and enough soil to fill the cup.
3. Explain that just as the children will grow and develop over the school year, so will the flowers. Ask children to brainstorm what they think the flowers need to grow. Record their ideas on a second piece of chart paper. If necessary, provide prompts to include water, soil, and sun.
4. Have children prepare their plants by placing the soil in the cup, placing the seeds in the soil and adding water. (Prepare the six extra experimental plants.)
5. Explain that some of the plants will be experimental plants and will stay in the classroom the whole school year. Together they will investigate what happens when the experimental plants don't have some of the things on their list. Mark 3 experimental cups "water" and 3 "no water."

6. Place 1 "water" plant and 1 "no water" plant in a dark closet; 1 "water" plant and 1 "no water" plant in a windowless room that has a light always on; and 1 "water" plant and 1 "no water" plant in a sunny window. If the children listed things other than air, water and light, brainstorm where else they want to experiment with placing the extra plants, and label these accordingly.
7. Explain that one of the plants in each location will be watered with a certain amount of water on a routine basis (those labeled "water") and the other (labeled "no water") won't receive any water. Make sure there is a watering container that is always used with the same amount of water for each watered plant.
8. If keeping individual plants in the classroom, talk with children about caring for these and set up some type of routine care. If sending home, discuss routine care.
9. Assign responsibilities for caring for experimental plants on a routine basis. Include science notebook pages as a center for children to chart plant growth progress.
10. Discuss the growth progress of all plants throughout the school year (if possible). Plants should reach flowering stage and possibly produce seeds before the end of the school year.
11. Compare results from various experimental conditions and talk about why some of the plants are faring better than others. Take photographs to document the project and assist the children in remembering what the plants looked like at the beginning of the school year.

QUESTIONS FOR DISCUSSION

- What do children need to help them grow and learn over the school year?
- What do flower seeds need to grow and develop into flowers?
- Does it matter what kind of light plants get?
- Discuss why some of the children's plants grow more or less than others.

ASSESSMENT

Discussion	Participated during initial discussion and contributed something children need to grow and develop in school	Participated during initial discussion but did not contribute something children need to grow and develop in school	Did not participate in discussion but listened attentively.
	Named at least 1 thing plants need to survive	Repeated someone else's idea of what plants need to survive	Did not participate in discussion but listened attentively
Science Notebook	Over time, entries accurately represented experimental results as developmentally appropriate	Over time, entries mostly accurately represented experimental results as developmentally appropriate	Entries did not reflect experimental results

LEARNING CENTER ACTIVITIES

SCIENCE—Put out flower seeds and hand lenses so children can examine the seeds.

SCIENCE—Make a display of several different kinds of flower seeds and the seed packets. Ask children to chart the differences between the different types of seeds.

NUTRITION—Serve sunflower seeds for snack.

GROWING FLOWERS FROM SEEDS

Date _____

Draw the plants under each experimental condition:

Dark Room	Sunny Room	Room with Light
Water	**Water**	**Water**
No Water	**No Water**	**No Water**

SEE HOW THE TURKEY GROWS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Listen to a story about the life cycle of a turkey
- Explore how young turkeys are different than and the same as their parents
- Talk about the life cycle of the turkey
- Act out the life cycle of a turkey

GLES ADDRESSED

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., ~~butterfly~~, ~~frog~~, chicken, ~~snake~~, ~~dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., ~~butterfly~~, ~~dog~~, ~~frog~~, chicken, ~~snake~~)

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

MATERIALS

- Children's copies of *See How The Turkey Grows*
- Chart paper
- Marker

TEACHER PREPARATION

- Become familiar with story
- Examine pictures in story for details
- Divide one piece of chart paper into 2 sections labeled "egg" and "poult" or "juvenile turkey." Divide each of these sections in half and label one side "alike" and one side "different."

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Before reading the story, talk with the children about life cycles. A life cycle is a series of changes that every living thing goes through. For animals, it begins the minute a baby begins growing in an egg and continues until death. Not every creature has the same life cycle, but all follow a predictable pattern.
2. Explain that the story they are going to read together is about the turkey life cycle. Read through the story together pausing to examine the pictures and share ideas about what the children think is going to happen.
3. Once the story is finished, go through the story again with the children talking about each stage that the turkeys went through.
4. On the labeled piece of chart paper, introduce children to the terms describing the stages they just identified—egg, poult or juvenile. Some children may know that the female adult is called a hen, a 1-year old juvenile male is a jake and an adult male is a gobbler or tom. Have children use their book to examine the turkeys at each stage noting how they are similar to the mother and different. Write down all of the children's ideas, making sure to point out things that they miss. For example, the adult turkeys eat the same food as the poults.

5. Talk about what happened to all of the turkeys in the story. Discuss reasons why turkeys lay so many eggs and what would have happened to the remaining turkeys as well as the snake and fox if the young turkeys had not been eaten.
6. Discuss the similarities between the way turkeys grow and develop and other birds.
7. After discussing the stages that turkeys go through, review the life cycle one more time by acting it out. Remember the more enthusiastic the teacher is in acting out the life cycle of the turkey, the more real it will be to the children. They will learn about the life cycle in their actions!

    - Ask the children to first be the eggs. Tell them to curl up in the nest (rug or meeting area) into a tight ball as small as they can get. The nest is dry, and they are snug and warm in their eggs. Their mother is sitting on them keeping them warm and safe and dry. But they are growing inside their eggs. It is late spring and getting very crowded inside that egg so they must get out! They start peeping even before they are out of the egg. They want mother hen to get to know them even before they are out of the shell. They use their sharp little egg tooth to peck their way out. It takes a long time to crack out of their shells.

    - When they get out, they are wet; and it is very noisy with all of the peeping going on around them. It's dark but dry under mother hen. Now they are poults. It takes a little while to dry; but once they are dry, they are HUNGRY! In fact they want to eat and eat and eat. Now they are brown, fuzzy balls. As soon as all of the eggs have hatched and the poults are dry, mother hen takes them out to find food. But the little poults stay close to mom. They peck the ground looking for tasty seeds, scrumptious berries, delectable snails and juicy bugs. Mother hen keeps all of the fuzzy brown poults near her while they are so vulnerable. Whenever a predator is flying over or nearby, she calls low, guttural *Kelp! Kelp! Kelp!* The poults know to quickly duck under mother hen when they hear this sound. They are wary young poults, always listening for mother hen to call them back in case of danger. At night, they roost on the ground all crowded together under mother hen who keeps them warm and dry with her body.

    - It isn't long before they grow a little bigger and stray farther away from mother hen. They are foraging for food when they hear her give a loud warning call *PUTT! PUTT! PUTT!* Even though they have never heard this sound before, the young poults know this means freeze or hurry and hide! There is danger nearby! As soon as the poults hear this sound, they freeze or hide. Then they look for mother hen and follow her away from the danger. Sometimes they become food for another animal like a fox or a snake, but many of the poults eat and eat and eat and grow and grow and grow.

    - The poults are always growing, and very soon they have wing feathers. It is hot summer time. Now they are roosting in the trees at night with all of the other turkeys in the flock. Every night they fly up into the trees, and every morning they *Yelp! Yelp! Yelp!* as they fly down. Now they look like mother hen or a young jake (male). They stay close to mother hen but now hunt for those yummy tidbits farther away. They hang out with all of the other turkeys in their flock, foraging for food and listening for danger and always growing. They spend the fall and winter foraging for food. Sometimes when it is really cold and the ground is frozen, they have trouble finding food. Some of the weaker members of the flock die and become part of the soil.

    - Soon it is spring, and one day the turkeys move away from the rest of the flock. One hen hears *Gobble! Gobble! Gobble!* off in the woods. She answers with an excited *Kelp! Kelp! Kelp!* She sees a fine turkey who sings a fine song so she stays with him all day long! Soon the hens and the gobblers go back to the flock and are again foraging for food.

    - Then one spring day mother hen makes a nest with leaves and sticks and twigs. She lays eggs in the nest and sits on the eggs to keep them warm and safe and dry until they hatch.

QUESTIONS FOR DISCUSSION

- How is Jane like her mother? How is she not like her mother?
- What would happen to the snake and fox if they didn't eat a young turkey?
- What would have happened to Jane if she had to share the food she found with 2 more turkeys?
- Why do you think turkeys lay so many eggs?

ASSESSMENT

Discussion of Story	Actively contributed to discussion, pointing out changes in the turkeys as the story progressed	Attentively listened to the discussion but did not contribute
Identifying Similarities	Suggested 3–4 similarities between young turkeys and the adults	Suggested 1–2 similarities between young turkeys and the adults
Identifying Differences	Suggested 2–3 differences between young turkeys and the adults	Suggested 0–1 difference between young turkeys and the adults
Acting	Enthusiastically acted out all stages of the life cycle of the turkey	Acted out some of the stages but participated only minimally

LEARNING CENTER ACTIVITIES

ART—Encourage the children to create a map of the area the turkeys in the story traveled, indicating places where key events occurred (nest, food, snake, fox, roost trees, hunter, gobbler, etc.).

MATH/MANIPULATIVE—Provide turkey life cycle cards at each stage of development and challenge children to put them in correct order.

READING—Make the story into a flannel board story and challenge the children to retell the story using the felt pieces.

WRITING—Put out small blank books for the children to write "All About Books" illustrating other bird species life cycles. Be sure to include colored pencils or markers for illustrating.

GROUP—When escorting children through the halls, ask them to pretend that the teacher is mother hen and the children are the young poults. They must be very quiet so they don't draw the attention of predators. Mother hen can kelp softly, contentedly as she leads the poults down the hall. The teacher can also practice kelping for danger to gather the poults together in order to get their attention or quiet everyone down.

OUTDOOR INVESTIGATION

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Investigate the outdoor space around the school looking for both natural objects and objects made by people
- Record observations using words and/or pictures on science notebook pages
- Identify both natural objects and objects made by people

GLES ADDRESSED

ST.1.A.K-1.a Observe and identify that some objects occur in nature (natural objects); others have been designed and made by people

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings ~~and maps~~, ~~data tables~~, graphs (bar, ~~pictograph~~), writings

MATERIALS

- Science notebook pages
- Pencils
- Digital camera (optional)
- Blank chart paper
- 2 pieces of chart paper divided in half with one side labeled "natural" and the other labeled "people-made"
- Chart paper with a blank bar graph
- Marker
- Several people-made objects (silk flower, piece of concrete, paper leaf, crayon, anything from the classroom) and several natural objects (pinecone, rock, leaf, bark, etc.)
- Tray to hold objects
- Safe area around school to explore—this might be the outdoor classroom or even the playground

TEACHER PREPARATION

- Scout area to determine boundaries for children and what they might encounter
- Identify and resolve any safety issues
- Gather science notebook pages and pencils
- Divide one piece of chart paper in half, labeling one side "natural" and the other "people-made"
- On one piece of chart paper make a bar graph to be filled in after children discover people-made and natural objects
- Gather several objects that are people-made and several that are natural
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside to prepare them for the investigation. Place the people-made and natural objects out on a tray. Ask the children if they can think of any way these objects might be divided into two groups. Sort objects according to their ideas. When the objects are sorted according to natural and people-made, move to the next step. If children don't sort them in this manner after several sortings, suggest that there is another way that they might be sorted and sort them accordingly.

2. Discuss the difference between people-made and natural objects. Ask children to brainstorm other things they can think of that are people-made and things they think are natural. Record their responses on the chart paper and the reasoning behind their choices. Discuss whether or not the class agrees with the ideas placed on the chart. Discussing the reasoning behind their choices allows the teacher to glean their understanding and how to channel the experience to change errors in children's thinking.
3. Once the children seem to have a grasp of things that are people-made and those that are natural, distribute science notebook pages and pencils. Suggest to children that they are going to put on their scientist eyes and investigate the playground for people-made and natural objects. Each child should find at least 2 objects that are people-made and 2 that are natural. Once children find something, they should draw it and write the name of it in their science notebook pages.
4. If there are rules or boundaries to their investigation, these should be discussed before allowing children to investigate.
5. Allow the children to explore the outdoor play space. The teacher can record the children's investigations with the camera. Taking pictures of their ideas of people-made and natural objects will assist in the assessment process as well as document the learning. Talk with children as they work asking questions about their choices.
6. Once all of the children have recorded their ideas, gather them as a group. Use the second piece of chart paper to record their findings, encouraging them to use their science notebook pages to help them remember what they recorded.
7. Once all of the children have shared and collaborated on their ideas, count to see if they found more people-made or natural objects. Create a bar graph to record their findings.

QUESTIONS FOR DISCUSSION

- Why do people make things?
- How did the natural objects get in this area?
- What happens to people-made things when people don't need them anymore?
- Where could we explore that would have more natural objects than people-made ones?
- Where could we explore that would have more people-made objects than natural ones?

ASSESSMENT

Discussion	Contributed during initial discussion and accurately named at least one people-made and one natural object	Contributed during initial discussion but accurately named either a people-made object or a natural object	Did not contribute to the discussion but listened attentively
Outside	Actively looked for people-made and natural objects throughout the time allotted	Actively looked for people-made and natural objects throughout most of the time allotted	Actively looked for people-made and natural objects some of the time allotted
Science Notebook	Recorded 2 or more people-made objects and 2 or more natural objects using developmentally appropriate drawing and writing	Recorded 1 people-made object and 1 natural object using developmentally appropriate drawing and writing	Recorded either a people-made object or a natural object using developmentally appropriate drawing and writing
Final Discussion	Accurately named 2 or more people-made objects and 2 or more natural objects found during the investigation to be included on the chart	Accurately named 1 people-made object and 1 natural object found during the investigation to be included on the chart	Accurately named either a people-made object or a natural object to be included on the chart

LEARNING CENTER EXPERIENCES

ART—Put out various props so children can recreate the outdoor space during center time. Use green paper for grass, straws and twigs stuck in clay for trees and telephone poles, etc. Place pictures of the area nearby so they can check for accuracy. Place paper on clipboards in the area and encourage children to draw maps and label what they saw and where it was located in the outdoor area.

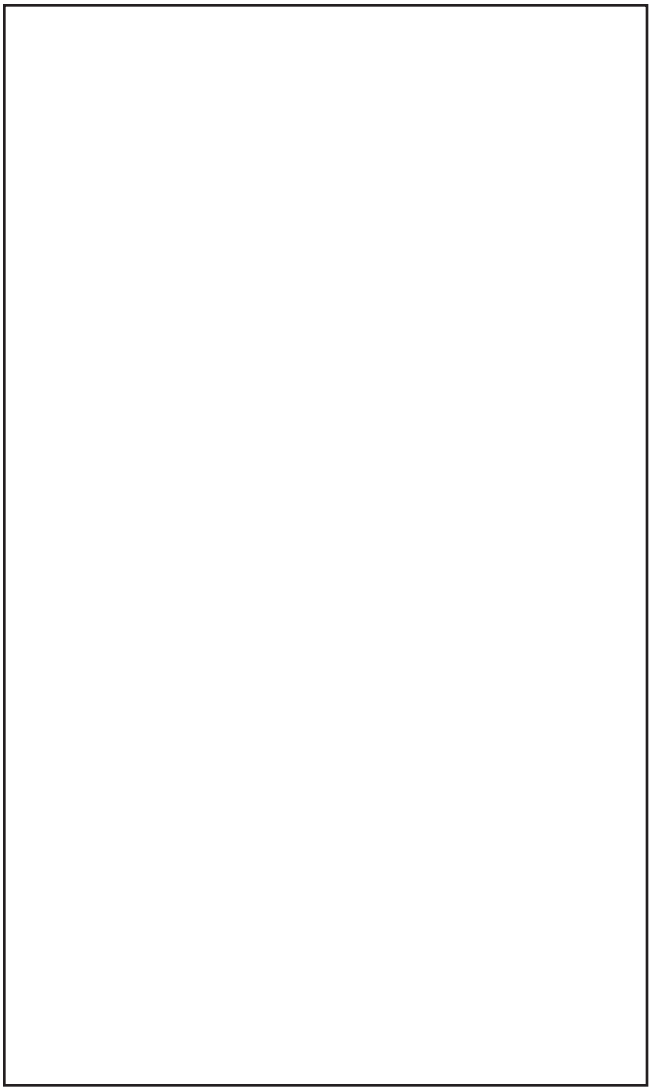
BULLETIN BOARD—Provide materials for children to work together to produce a map of the play yard or outdoor classroom where this learning event took place. Natural materials can be used to assist in creating the map. For example, twigs or cedar sprigs might be used to create the trees, mud might be used to paint in sand or roads, rubbings could be created to represent pea gravel, etc. Place the photographs around the map along with an explanation of the experience and the chart of people-made and natural objects in the area.

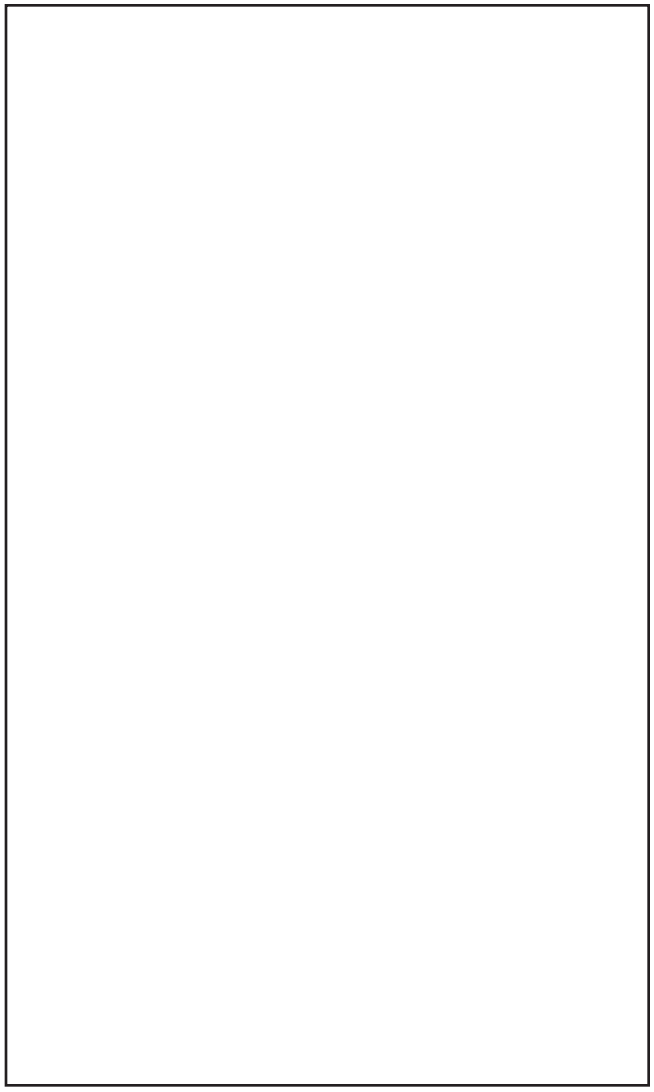
MATH/MANIPULATIVES—Use photographs of people-made and natural objects to make various games for the children to play. They can be sorted into people-made or natural objects. Doubles could be created to play a memory game, and before the children keep each match they must name whether the object is people-made or natural. Photographs could also be taken to include groups of objects so children collect sets (kitchen objects, trees, flowers, toys, etc.) and play games like Go Fish. Photographs could be used to create graphs of people-made and natural objects.

HOME AND SCHOOL CONNECTION—Ask children to draw a map of their backyards including important features. After finishing their maps, ask them to label or code the features as people-made or natural.

PEOPLE-MADE

Draw 2 people-made objects you found.



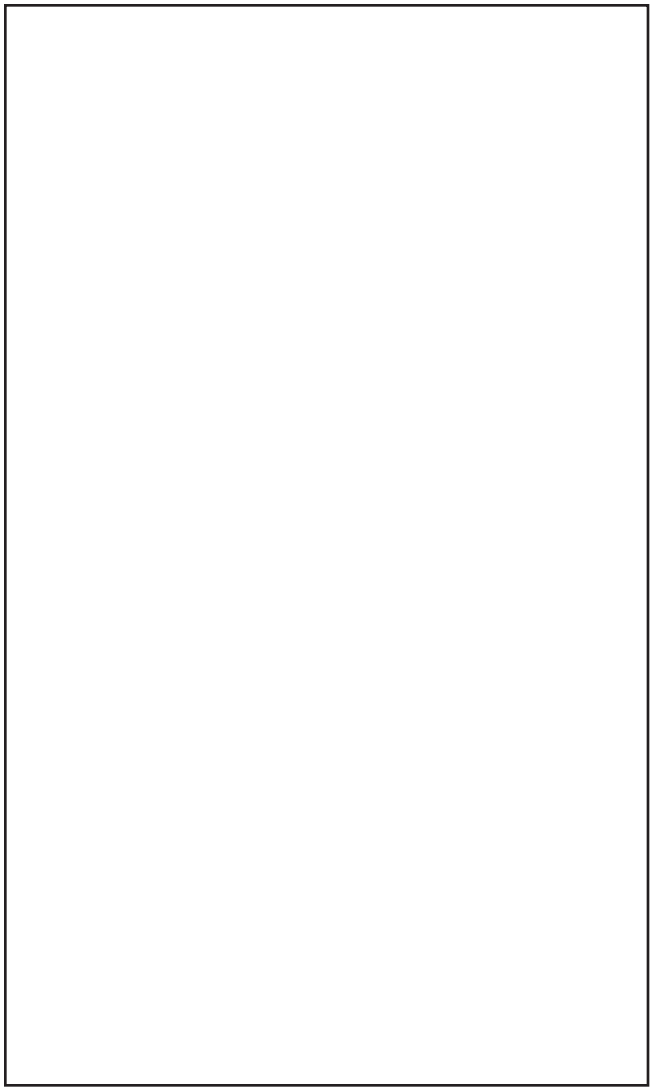


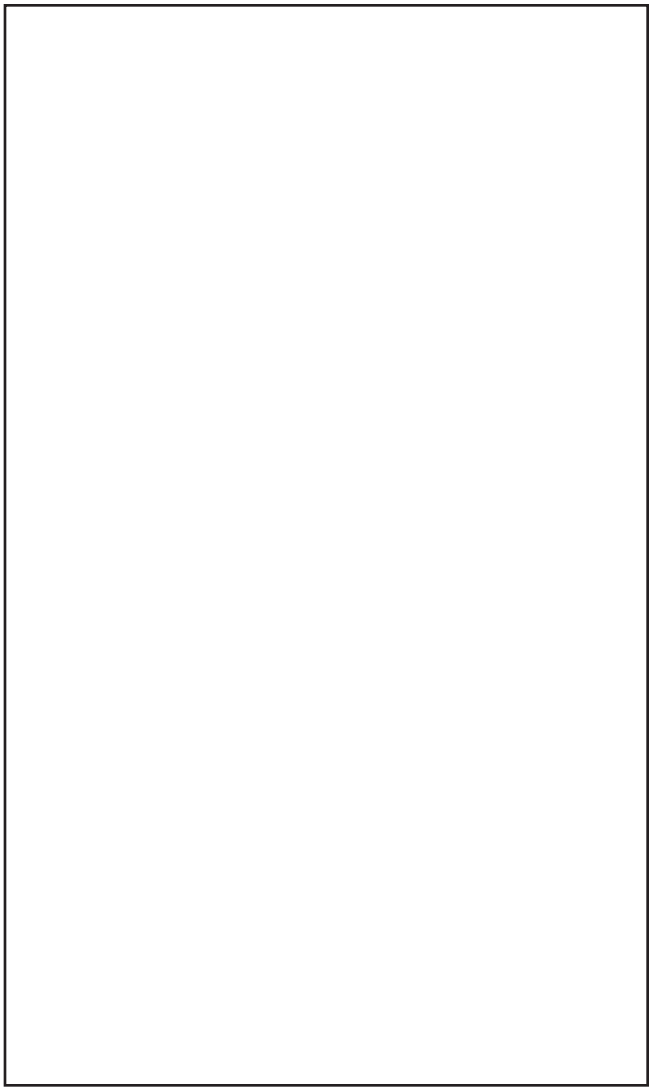
Write the names of the people-made objects.

_____ _____

_____ _____

Draw 2 natural objects you found.





Write the names of the natural objects.

_____ _____

_____ _____

SUMMER TREE PORTRAITS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Explore the importance of trees
- Identify some of the ways people and animals use trees
- Create a tree drawing
- Record tree facts

GLES ADDRESSED

EC.1.A.1.a Identify ways man depends on plants and animals for food, clothing, and shelter
LO.1.A.1.b Describe the basic needs of most plants (i.e., air, water, light)
UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (summer, ~~fall~~, ~~winter~~, ~~spring~~)

MATERIALS

- Outdoor area with at least one shade tree and a sunny day
- Pictures of animals that live in trees (squirrel, raccoon, bird, etc.)
- Magazine pictures of tree products (paper, fruits, nuts, musical instruments, fireplace burning wood, houses, etc.)
- Chart paper
- Markers
- Cardstock
- Colored pencils

TEACHER PREPARATION

- Select an outdoor area and a place where children may work
- Gather supplies

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together under the shade of the trees.
2. Ask children to share what they know about trees. Write down their ideas on the chart paper (even those that are inaccurate). Discuss with group each item that is added.
3. Discuss animals that might live in trees. Share pictures of animals as the children bring them up.
4. Make a list of their ideas about ways trees help people and animals (shade, food, erosion prevention, etc.).
5. Talk about products that people use from trees, such as paper, food, wood for heat, etc. Share pictures of these as children mention them.
6. Encourage children to experience the difference between sitting under the shade of the tree and sitting in the sun.
7. Talk with the children about things in the immediate environment that help the tree.
8. Discuss unique features of trees with the children. Talk about the way the branches come out of the tree, the different leaf structures, the roots visible on the ground, the different kinds of bark, etc.
9. Ask children to take off their shoes and socks and be the tree. Tell them to stand up with their toes digging into the grass. Feel their roots holding on and drinking up moisture. Now the moisture moving up through their trunk all the way to their leaves. They should lift their branches (arms) high into the sky, swaying as the wind rustles their leaves. Breathe in deeply through their leaves. Feel the air reaching down to their roots. Close their eyes and be a tree!

10. After pretending to be a tree, encourage each child to select a favorite tree and draw it as accurately as possible on cardstock using the colored pencils. As they draw, remind them what it was like to be the tree. They should think of all of the tree parts and how each helps the tree. When their drawings are finished invite children to include other things in the picture that trees need to survive and/or things that indicate how they benefit people and animals. Lastly ask them to write tree facts about their tree on the back.
11. Display their tree drawing then save them to refer to later in the year.

QUESTIONS FOR DISCUSSION

- How do you know when a plant is a tree?
- What do trees need to live or survive?
- Is there anything living in your tree? How do trees help people? Animals?
- What will happen to the trees when it gets colder outside?
- What do trees do in fall? Winter? Spring?

ASSESSMENT

Discussion	Participated during initial discussion and stated something accurate he/she knew about trees	Participated during discussion but did not share any new ideas or information about trees	Did not participate in discussion but listened attentively
	Named at least 1 way that people use trees	Repeated someone else's idea of how people use trees	Did not participate in discussion
Drawing and Writing	Drawing of tree included trunk, branches, leaves and roots	Drawing of tree included some but not all parts of the tree	Drawing of tree did not resemble tree or any animal that lives in a tree
	Artwork and writing included 2 or more ways trees help people and/or animals (home for animals, fruit for food, etc.) as developmentally appropriate	Artwork and/or writing included 1 way trees help people and/or animals as developmentally appropriate	Artwork and/or writing included only the tree depicted as developmentally appropriate
Writing	Wrote 2 or more accurate facts about trees as developmentally appropriate	Wrote 1 accurate fact about trees as developmentally appropriate	Wrote about trees but inaccurate information as developmentally appropriate

LEARNING CENTER ACTIVITIES

ART—Provide paper and colored pencils for children to draw a map of the outdoor area where their tree is located. Encourage them to include important features on the map including their tree. Keep this map for later reference.

MATH/MANIPULATIVE—During center time, provide animal cards for children to sort by what lives in trees and what doesn't. Have children create a chart of animals that live in trees and those that don't.

READING—Look for animals that live in trees throughout *See How the Turkey Grows*. Talk about how the trees are used by the animals throughout the story.

WRITING—put small blank books out for children to create their own tree books.

OUTSIDE—Adopt a tree. Make a list of the children's ideas about how they can help care for it. Some suggestions might include: water it, mulch around its trunk, fertilize, don't pull on the branches, put bird and squirrel feeders in it, plant flowers under it, etc. Visit the tree throughout the seasons, creating a book about the tree during each visit.

WHAT HAPPENS IN THE SUMMER?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify characteristics of summer
- Draw pictures of people and animals in the summer

GLES ADDRESSED

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (summer, ~~fall~~, ~~winter~~, ~~spring~~)

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities, food)

MATERIALS

- Science notebook pages
- Colored pencils or crayons
- Pencils
- 3 pieces of chart paper
- Marker
- Children's copies of *See How the Turkey Grows*

TEACHER PREPARATION

- Gather materials
- Label one piece of chart paper—"Characteristics of summer"
- Label a second piece of chart paper—"Things people do in the summer"
- Label the third piece of chart paper—"Things animals do in the summer"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside on a typical late summer day. Ask them what time of year it is. Someone is sure to say summer. Ask how they know it is summer.
2. Read through *See How the Turkey Grows* with the children and talk about which pages depict summer. Ask them to consider how the author and artist indicated it was summer.
3. On the chart paper, record their ideas about how they know it is summer. Provide more guidance by asking how summer is different than the rest of the year. Ask about how the environment changes. Prompt with questions about the weather, plants, precipitation, etc.
4. Once children have provided a number of characteristics of summer, flip to the second piece of chart paper labeled "Things people do in the summer." Ask children to list things they do in the summer that they cannot do other times of the year. List their ideas. Expand their responses with questions about how they dress and what they eat.
5. Finally flip to the last piece of chart paper and ask the children what animals do in the summer that they don't do during other times of the year. Prompt them with questions about how they look, eat, travel and where they live.
6. Once children have made many suggestions that distinguish summer for people and animals, distribute science notebook pages. Challenge children to draw a self portrait of themselves doing something in

the summer. Talk about what they might include in the drawing that would help the viewer know it was summer. On the second page they should draw a portrait of an animal in the summer, again being careful to include an animal they might see in Missouri during the summer as well as elements in the picture that suggests summer to the viewer.

7. Allow children to spread out throughout the outdoor space to draw themselves and an animal in summer.
8. When finished gather children back together and suggest that they share their illustrations. Collect them and bind them together to create a class book entitled *What Happens in the Summer?*

QUESTIONS FOR DISCUSSION

- How do you know when it is summer?
- How is summer different than other seasons of the year?
- How do plants look in the summer? Why?
- What is the weather like in the summer?
- What do people do in the summer that they can't do other times of the year?
- What do people wear in the summer? Eat in the summer? Play in the summer?
- What do animals do in the summer that they don't do other times of the year?
- How do they look in the summer? Travel in the summer? Eat in the summer?
- Where do animals live in the summer?

ASSESSMENT

Discussion	Participated during initial discussion and contributed 4 or more characteristics of summer	Participated during initial discussion and contributed 2–3 characteristics of summer	Participated during initial discussion and contributed at least 1 characteristic of summer
Summer Self-portrait Science Notebook Drawing	Self-portrait clearly indicated summer through clothing, activity and background as developmentally appropriate	Self-portrait indicated summer through clothing, activity or background as developmentally appropriate	Self-portrait hinted at summer through clothing, activity or background as developmentally appropriate
Summer Animal Science Notebook Drawing	Animal drawing clearly indicated summer through animal depicted, resemblance to animal in summer, activity and background as developmentally appropriate	Animal drawing indicated summer through animal depicted, resemblance to animal in summer, activity or background as developmentally appropriate	Animal drawing vaguely hinted at summer through animal depicted, resemblance to animal in summer, activity or background as developmentally appropriate

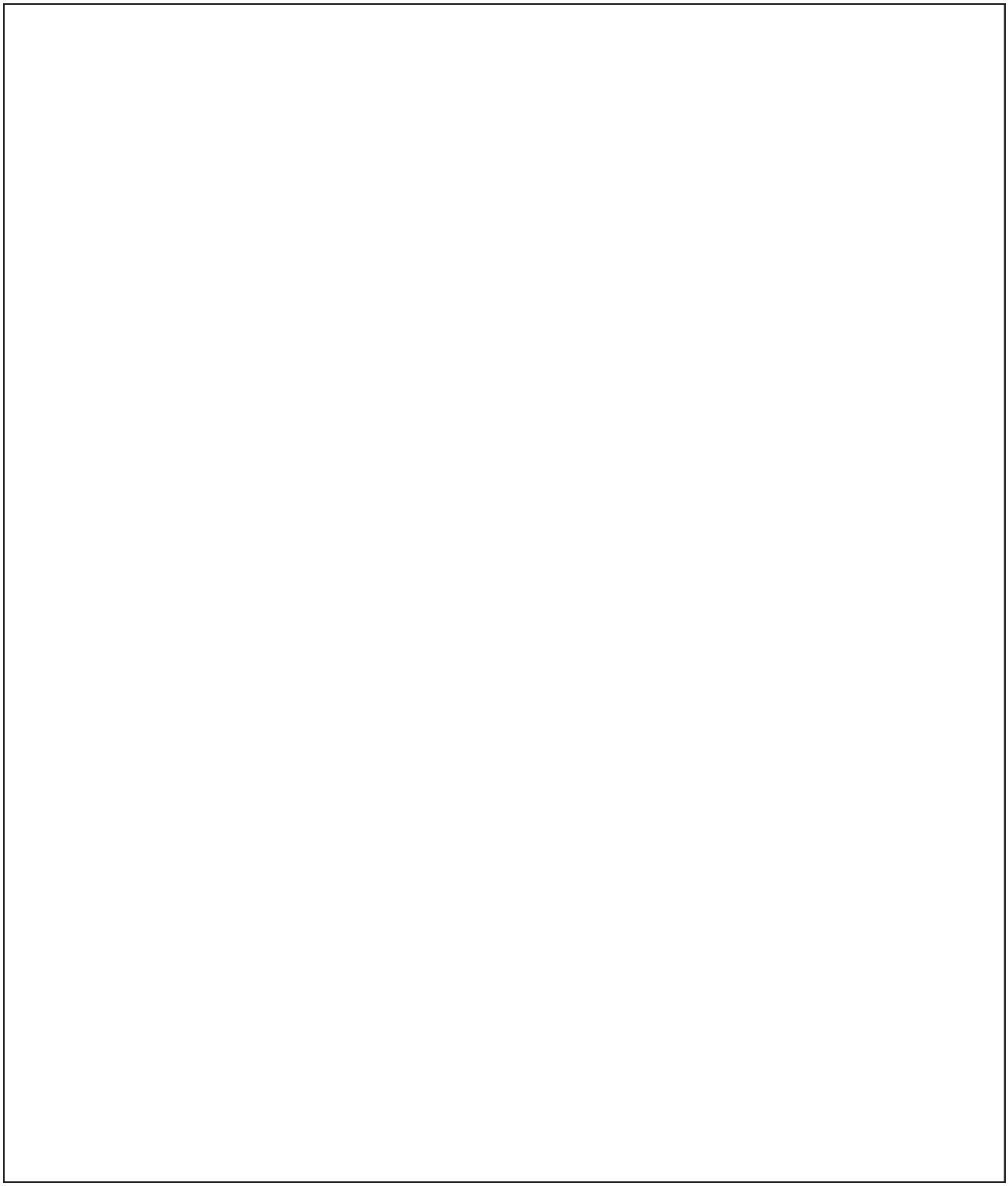
LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Sort animal and plant cards by those they might see in the summer and those they would not.

WHAT HAPPENS IN THE SUMMER?

Summer Self-Portrait

WHAT HAPPENS IN THE SUMMER?



Summer Animal Portrait

WHAT'S THE TEMPERATURE?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Make a hypothesis about temperature differences in various outside locations
- Explore how to read a thermometer to determine the temperature
- Compare temperatures in various outside locations

GLES ADDRESSED

ES.2.F.1.b Compare temperature in different locations (e.g., inside, outside, in the sun, in the shade)
SI.1.B.K-3 Make qualitative observations using the five senses
SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., ~~magnifiers/hand lenses~~, ~~magnets~~, ~~equal arm balances~~, thermometers)
SI.1.B.K-3.d Compare amounts/measurements

MATERIALS

- A fairly hot day
- Outside area with deep shade
- Outside area with direct sun
- 3 labeled pieces of chart paper
- Unlabeled chart paper
- Marker
- Thermometer
- Thermometer stamp and stamp pad
- 2 or more flat containers or tubs
- Sand (enough to place a ½" or less of sand on the bottom of each container)
- Panoramic map of area

TEACHER PREPARATION

- Scout area to determine boundaries for children and what they might encounter
- Identify and resolve any safety issues
- Gather materials
- Label the first piece of chart paper "Hypotheses," the second "Sensory Results" and the third "Actual Temperatures." Divide each chart in half labeling one side "Warmest" and the other side "Coolest."
- Create a panoramic map of the area. This is a map that looks at the area as if you are in a tree house looking down. This map is more easily read by children than an aerial or bird's eye view because they can concretely see the features in the map rather than just the tops of things. Copy this map for future uses throughout the year.

PROCEDURE

1. Gather children outside on the playground or in the outdoor classroom. Discuss the weather conditions, especially the temperature.
2. Explain to children that a prediction is a guess about something they think is going to happen or they will find. A hypothesis is an educated guess about something they think they will find. It is based upon what they already know about the phenomena.

3. Challenge children to make a hypothesis of where they think the warmest place in the outdoor area is and where the coolest is. Record their hypotheses on the chart. Talk about what information they are using to make their hypotheses.
4. Once their hypotheses have been recorded, challenge children to go and test their ideas. Talk about what the temperature might feel like using their senses.
5. Again, gather the children and discuss their findings. Talk about how they determined whether or not they were correct. Record their findings on the chart labeled sensory results. Explain that sensory results means results based upon what they felt using the senses of their body.
6. Talk with children about how their hypotheses may have influenced their sensory findings. In other words, did they find that a particular place was hot or cool simply because they thought it was going to be warm or cool. Discuss how sometimes our ideas about something influence how we experience it.
7. Brainstorm ways they could scientifically test to see if their hypotheses were correct. Record their ideas on the unlabeled chart paper.
8. Look over the list and probably someone will suggest using a thermometer. If not, show the children a thermometer and explain its purpose.
9. After showing the thermometer to the children, ask them to pretend to be the liquid inside a thermometer. They should stand so they aren't touching anyone else and squish themselves small and thin to fit inside of the tube and hold their stomach in tight. Remind them how the liquid in the thermometer goes up when it gets warmer and down when it gets colder. This is what they are going to do when you describe the weather. Once children are ready, describe different weather situations that would cause the temperature in the thermometer to go up and down. For example, it is a very hot day, and the sun is beating down on you until you reach 99 degrees F. Then a cloud goes in front of the sun, and you cool down to 85 degrees. Continue describing various temperature situations until the children accurately portray all you describe.
10. Then talk with the children about how you have a way to scientifically test their ideas about the warmest and coolest places using thermometers.
11. Allow children to place about ½" of sand in each container, smoothing the sand evenly along the bottom. Encourage children to place their hands on the sand in each container to determine if each container feels like it is the same temperature as the others.
12. Again, encourage the children to make hypotheses about where they think the hottest and coolest places are. Determine as a group which places they would like to test. Record these on the last chart.
13. Use a thermometer to measure the initial temperature of the sand in each container, noting that all are starting at the same temperature. During this process, demonstrate how to read the thermometer to determine the temperature. Record initial temperature on the top of the last chart, using both the thermometer stamp as well as writing it numerically. Place the containers in the areas the children determined were most likely to be the hottest and coolest.
14. Leave the area for 60 minutes, allowing the sand to warm or cool. When you return to the experiment, use the thermometer to measure the temperature, recording the results on the chart. Allow children to lay their hands flat on the sand to feel the difference in temperature in the various locations. Record the results (both on the printed thermometer and numerically) on the chart paper noting hypotheses that were correct and those that were not.
15. Use the map to mark the temperature of each location tested, indicating the warmest in red and the coolest in blue. Explain this code to the children—red is a warm color, like fire, and blue is a cool color, like snow and ice.

QUESTIONS FOR DISCUSSION

- What makes one place warmer than the other?
- Where is the temperature taken that is reported on the news? In the sun? In the shade?
- Some places in the sun feel hotter than others (concrete vs. grass). Why?

ASSESSMENT

Initial Discussion	Contributed during initial discussion and made a hypothesis about the hottest and coldest place	Contributed during initial discussion and made a prediction about the hottest and coldest place	Contributed during the discussion but made neither a prediction or hypothesis
Hypothesis	Provided plausible reason for the hypothesis made		Predicted hottest and coldest place but provided no explanation
Exploration	Explored places looking for those that were hot and those that were cool throughout the allotted time	Explored places looking for those that were hot and those that were cool most of the allotted time	Explored places looking for those that were hot and those that were cool only part of the allotted time
Final Discussion	Contributed during final discussion comparing hot and cool places in the area	Listened attentively during discussion but did not contribute or make a comparison between hot and cool places	

LEARNING CENTER ACTIVITIES

ART—Challenge children to draw their own maps of the outdoor area where the experiment was conducted. Include a key or legend indicating warmest and coolest places in the area.

MATH/MANIPULATIVES—Make cards with thermometers displaying various temperatures and a chart labeled hot/cold. Encourage children to sort cards according to whether they show a hot or cold temperature.

READING—Challenge children to find the warmest and coldest pages in *See How the Turkey Grows*. Ask them to write about how they know it is warm or cold in the illustration.

SCIENCE—Create hypotheses recording sheets and challenge children to make hypotheses about the warmest and coolest places in the classroom. Provide several thermometers and encourage children to test their hypotheses. Record their results on a panoramic map of the classroom.

MEASURING THE RAIN

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Make a rain gauge
- Assist in deciding where in the outdoor environment to place the rain gauge

GLES ADDRESSED

ES.2.F.1.a Observe, measure, record weather data throughout the year (i.e., ~~cloud cover~~, ~~temperature~~, precipitation, ~~wind speed~~) by using ~~thermometers~~, rain gauges, ~~wind socks~~

MATERIALS

- 2 liter soda bottle (one per small group or per child)
- Ruler or consistent measuring stick
- Colored plastic tape
- Small, clean rocks
- Water
- Rainy day

TEACHER PREPARATION

- Cut top off of soda bottles
- Gather materials

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together and explain that one way to watch the weather is to measure the rain or precipitation. Weather scientists or meteorologists use a special tool called a rain gauge to assist with this. Ask them to share their experiences with rain gauges.
2. Provide materials to individuals or small groups and give the following instructions for making a rain gauge:
    - Place small rocks in the bottom of the soda bottle until indentations at the bottom of the bottles are filled and rocks are level.
    - Pour water into the bottle until it is just above the rocks.
    - Mark the top level of the water using a piece of plastic colored tape with the top of the tape even with the top of the water.
    - Place the top of the bottle in the soda bottle with the funnel flowing into the bottle.
3. Brainstorm about where to place the rain gauges in the school's outdoor space. Talk with the children about where they think might be the place that would give the most accurate measurement. Challenge them to think about possible issues or problems with each area.
4. Place the rain gauges outside. The amount of rainfall can be measured by placing a ruler or another measuring device next to the bottle with the bottom of the ruler even with the top of the tape. Once the rainfall has been recorded pour off the water until it is again even with the top of the tape.
5. Practice recording the rainfall on the ruler template. If using a stick to measure the rain level, place it next to the ruler and mark accordingly. If using a ruler, show children how to read and mark the ruler on the drawing to indicate the measurement.

QUESTIONS FOR DISCUSSION

- How do meteorologists measure the rain?
- What might make our measurements inaccurate?
- What should we consider when deciding where to put our rain gauge?
- How could we figure out if it rains the same at your house and school?
- Why do we need rain?

ASSESSMENT

Rain Gauge	Created a rain gauge with group or individually	Needed assistance creating a rain gauge with group or individually
Discussion	Contributed ideas about where to place rain gauges considering obstacles and/or hindrances that might prohibit accurate measurement	Contributed ideas about where to place rain gauges but did not consider obstacles or hindrances to accurate measurement

LEARNING CENTER ACTIVITIES

ART—Put out watercolors and crayons. Challenge children to create pictures of people and/or animals doing things in the rain.

MATH/MANIPULATIVE—Place additional water in several of the rain gauges and set out with rulers. Challenge children to practice measuring the rain using rulers or some other consistent type of measuring device. Provide ruler recording sheets for children to practice recording their measurements.

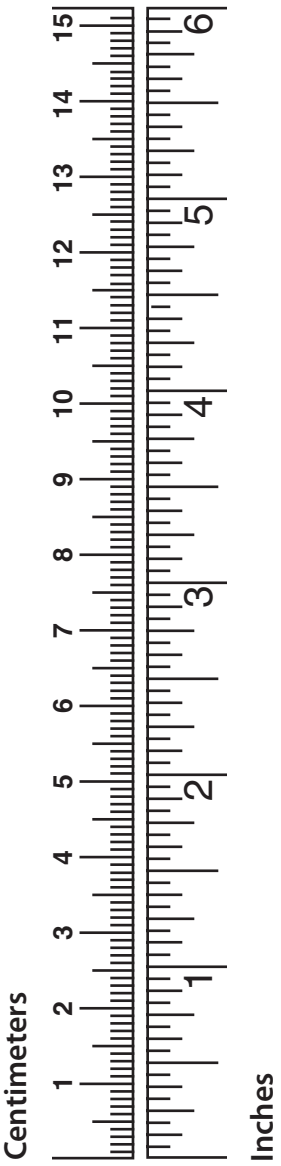
MUSIC—Provide a Chilean Rain Stick to experiment with making rain music.

MUSIC—Make recordings of rain falling on different surfaces, for example a tin roof, sidewalk, grassy field, etc. Challenge children to draw pictures of things they think the rain is falling upon. Talk about the various differences in sounds.

SCIENCE—Place different types of material (nylon, denim, wool, flannel, plastic, cardboard, rubber, etc.), eyedroppers and water in the science area. Challenge children to test which are most water resistant by dropping an eyedropper of water on each. Findings can be charted or recorded in their science notebook pages.

READING—Ask children to find illustrations in *See How the Turkey Grows* that show rain or moisture in the air. Challenge them to consider how the artist depicted rain. Provide materials and encourage them to try depicting rain in the same manner as the artist.

HOME AND SCHOOL CONNECTION—If individual rain gauges are created, send them home with children so they can create a weather station at home. Create a recording sheet so children can record rainfall at home. Each time it rains encourage the children to compare the amount of rainfall at home with the amount of rainfall at school. Include a map illustrating the sites and look for patterns of rainfall.



HOW STRONG IS THE WIND?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Measure the wind using string
- Discuss wind strength

GLES ADDRESSED

ES.1.C.K.a Observe wind as moving air that is felt

ES.2.F.K.a Observe and describe daily weather; ~~precipitation (e.g., snow, rain, sleet, fog)~~, wind ~~(i.e., light breezes to strong wind), cloud cover, temperature~~

MATERIALS

- Wind chart
- 1 piece of heavy string per child
- Windy day
- Wind measurement practice page
- Pencils

TEACHER PREPARATION

- Create a chart showing the 3 different wind speeds the children will record. Be sure to draw a picture of how the string looks at each speed and the words to describe each (string hanging down = no wind, string straight out, perpendicular to the ground = strong wind, string hanging some place in between = slight or moderate wind). Please note that as the year progresses and the children become more adept at measuring and recording wind, you can create more levels by describing or illustrating the string at angles in between those already listed.
- Cut string for each child 12–18" long
- Prepare to take advantage of a windy day

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside.
2. Demonstrate how to measure the wind by holding the string in your fingers and determining whether or not it hangs down (no wind), blows straight out (strong wind) or hangs some place in between (slight or moderate wind).
3. Ask children to spread out around the outdoor area and measure the wind.
4. They should record their findings in their science notebook pages with a picture, including the angle of the string, and written description.
5. Discuss and compare the children's findings after everyone is finished recording their findings.

QUESTIONS FOR DISCUSSION

- What are other ways you could measure the wind?
- What makes the wind?
- Why is the wind different in different places?
- How could we figure out which direction the wind comes from?

ASSESSMENT

Measuring the Wind	Used string to measure the wind as demonstrated by the teacher	Used string but did not hold appropriately for measuring the wind	Did not attempt to measure the wind
Science Notebook	Recorded wind speed using both drawing and writing in a developmentally appropriate manner	Recorded wind speed using either drawing and writing in a developmentally appropriate manner	Attempted to record wind speed
Final Discussion	Participated in final discussion offering thoughtful responses to the questions	Participate in final discussion but contributed no new ideas	Listened attentively to the final discussion but did not make any contributions

LEARNING CENTER ACTIVITIES

ART—Encourage children to make wind chimes by tying found items such as sticks, rocks, shells, etc., to a base such as rings from a six-pack, wire coat hanger or branch. Listen to them in the wind.

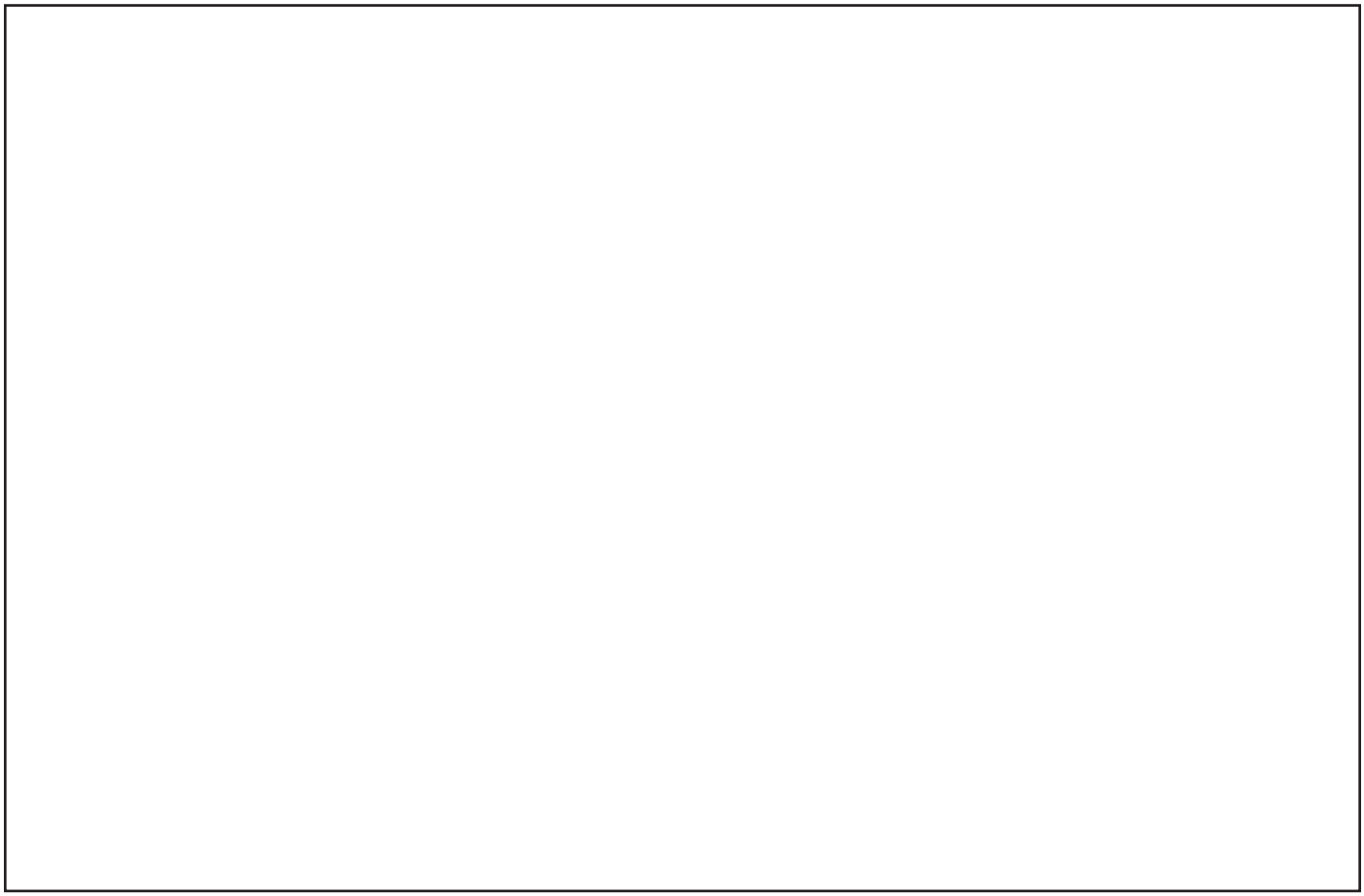
ART—Provide children with thin paint, straws and smooth paper. Encourage them to blow paint by dropping paint on the paper and blowing it using the straw. Compare the air coming through the straw with the wind.

READING—Look through the illustrations in *See How the Turkey Grows*. Ask them to find any illustrations portraying wind. Discuss how the artist represented wind so they would know it was blowing. Wind is usually something that is felt, so how can it be illustrated with pictures and words?

SCIENCE—Challenge the children to have wind races. Use ping pong balls or feathers and have children blow them along the track to see how fast they can go. Time them using a stop watch, or have them race one another.

OUTSIDE—Provide children with crepe paper streamers, scarves and or bubbles to use outside in the wind.

HOW STRONG IS THE WIND?



Draw how your string looked in the wind.

Write a description of the wind.

CLOUD WATCHING

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Observe clouds
- Draw clouds
- Write a cloud description
- Discuss how clouds help people predict the weather

GLES ADDRESSED

ES.2.F.K.a Observe and describe daily weather~~; precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind)~~, cloud cover, ~~temperature~~

ES2.F.1.d. Identify patterns indicating relationships between observed weather data and weather phenomena (e.g., ~~temperature and types of precipitation~~, clouds and amounts of precipitation)

MATERIALS

- Cloudy day
- Chart paper
- Marker
- Colored pencils
- Science notebook pages
- Camera (optional)

TEACHER PREPARATION

- Become familiar with various types of clouds. *Cirrus* (Latin for *lack of hair*) are high level clouds. Due to their height in the atmosphere, they are usually composed of ice crystals. They are generally thin, wispy clouds high in the sky. *Cumulus* (Latin for *heaped*) clouds appear midlevel in the sky. Since they are closer to the earth, they are usually made up of water droplets and are often light gray in color. They are puffy, heaped clouds, often with flat bottoms. *Stratus* (Latin for *spread out*) clouds are low level clouds made up of water droplets, ice particles or snow. They often spread in a long, stretched-out formation with low layers.
- Divide one piece of chart paper into columns labeled "Color," "Shape," "Texture" and "Level in the Sky"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside on a cloud-filled day. Talk about descriptive words that really help the listener/reader get a clear idea about what is being described. For example, ask the children to close their eyes and consider clouds that are described as big and white. Then ask them to picture clouds that are whitish gray, large, high in the sky and puffy and heaped on top of one another.
2. Ask them to help make a list of words they could use to describe clouds they have seen. Record their descriptions on the chart paper. Once their descriptions are recorded, talk about the words on the list that provide strong pictures in their minds. Put these words on the chart paper under the appropriate column of color, shape, texture and level in the sky.
3. Once children have a list of describing words, ask them to spread out around the outdoor area and lay on their backs observing the clouds. Ask them to consider the list they have created and how they might best represent the clouds that they see. When they are ready, ask them to sketch the clouds and write a description to help a reader see the clouds in their minds.
4. When the children are finished sketching and writing, bring them back together to share their work. Add any new words to the chart that help better describe the clouds.
5. Talk with children about how they think clouds help people predict the weather. Record their thoughts on chart paper and display so their ideas can be checked as they collect weather data throughout the year.
6. Display the chart so children may refer to it as they draw and write about their clouds in their weather observations.

7. Take pictures of the clouds that the children are sketching. As the clouds change throughout the year, take photographs to remind them of the various clouds they have observed.

QUESTIONS FOR DISCUSSION

- How would you describe the clouds?
- What colors, shapes and textures do you see?
- Where in the sky are the clouds?
- How do clouds help describe the weather?
- What do clouds have to do with the weather?
- How do clouds help people predict the weather?
- How do clouds look that are going to rain? Snow? Hail?
- Do clouds look different at different times of the year? How?

ASSESSMENT

Cloud Description Discussion	Contributed 4 or more words to describe clouds	Contributed 2–3 words to describe clouds	Contributed at least 1 word to describe clouds
Science Notebook Cloud Drawing	Cloud illustration accurately depicts details of clouds on the particular day children observed as developmentally appropriate	Cloud illustration depicts details of clouds on the particular day children observed with some inaccuracies as developmentally appropriate	Cloud illustration did not resemble clouds in sky on the particular day observed
Science Notebook Cloud Writing	Cloud description included strong, descriptive words to describe the clouds as developmentally appropriate	Cloud description included at least 1 strong, descriptive word to describe the clouds as developmentally appropriate	Cloud description included only vague or no descriptive words to describe the cloud as developmentally appropriate
Clouds and Weather Discussion	Contributed 3–4 ideas about how clouds look during different types of weather	Contributed 1–2 ideas about how clouds look during different types of weather	Listened attentively but did not contribute to clouds and weather discussion

LEARNING CENTER ACTIVITIES

ART—Provide children with construction paper, markers, glue and cotton balls. Encourage them to draw a cloud picture. Cotton may be used to add texture to the clouds.

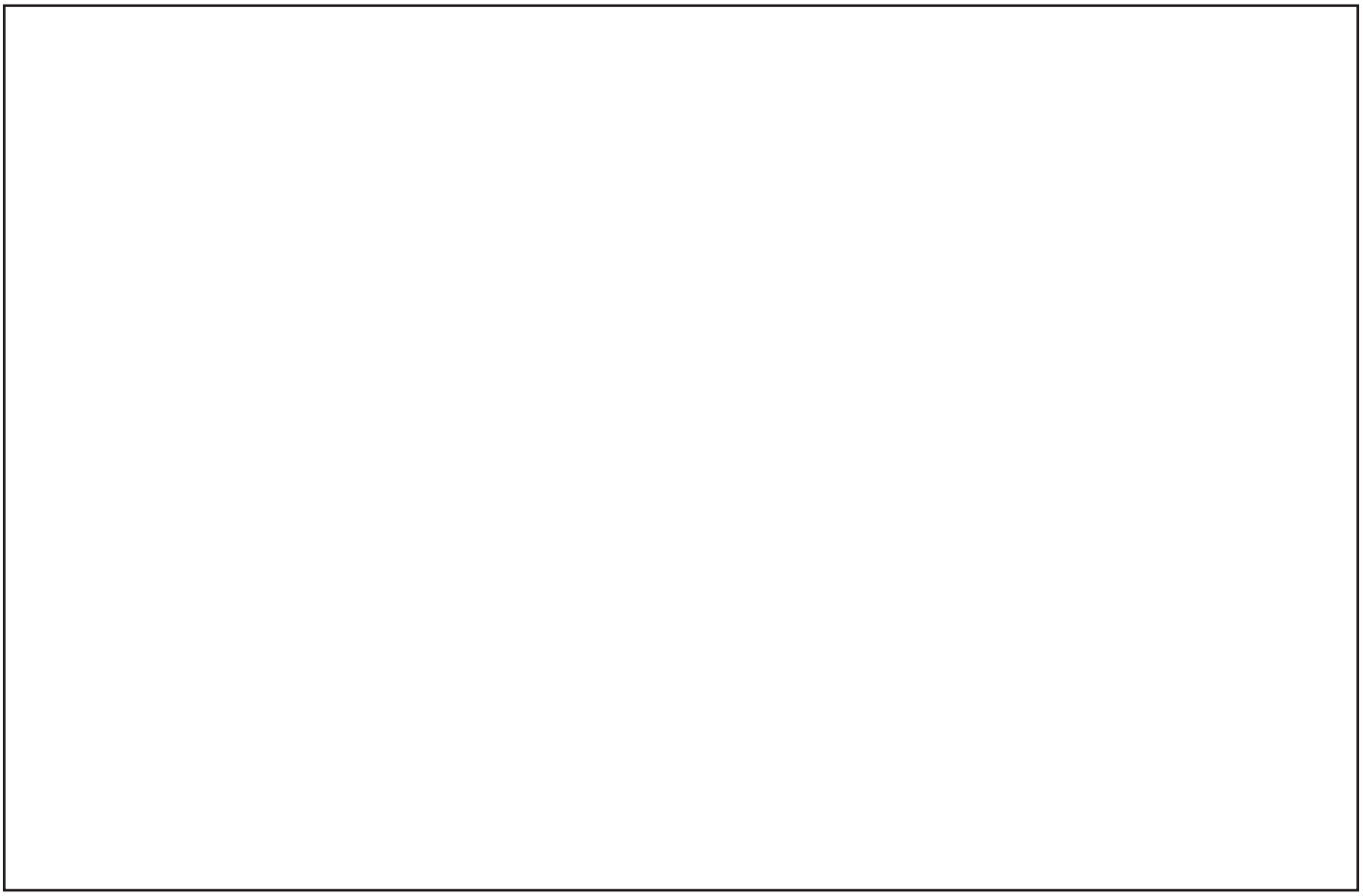
ART—During self-selected activity or free choice time, provide children with white typing paper, blue construction paper and glue. Encourage them to create cloud shapes by tearing the white paper and gluing the various shapes onto the blue paper.

BULLETIN BOARD—Take photographs of the various clouds the children observe. Record and transcribe their ideas about the clouds. Display the photographs along with their discussions, so children and parents can revisit the experience.

SCIENCE—Make a cloud with children by putting several inches of hot water into a cold jar. Put the lid on and place an ice cube on the lid. As the warm air rises, it is cooled and forms fog or a little cloud.

SCIENCE—Each day, make a drawing of the clouds. Date each of these and keep charts of the weather so children can make comparisons between types of clouds and weather.

CLOUD WATCHING



Draw how the clouds look.

Write a description of the clouds.

_____

_____

_____

_____

WEATHER OBSERVATION

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Brainstorm words that describe the weather
- Observe and describe the local weather on a routine basis
- Record weather data in a weather notebook

GLES ADDRESSED

ES.2.F.K.a Observe and describe daily weather; precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind), cloud cover, temperature

ES.2.F.1.a Observe, measure, record weather data throughout the year (i.e., cloud cover, temperature, precipitation, wind speed) by using thermometers, rain gauges, wind socks

ES.2.F.1.c Compare weather data observed at different times throughout the year (e.g., hot vs. cold, cloudy vs. clear, types of precipitation, windy vs. calm)

ES.2.F.1.d Identify patterns indicating relationships between observed weather data and weather phenomena (e.g., temperature and types of precipitation, clouds and amounts of precipitation)

MATERIALS

- Weather notebooks
- Pencils
- Chart paper
- Marker
- Thermometer
- Thermometer stamp and stamp pad
- Rain gauge
- Ruler or measuring stick
- String

TEACHER PREPARATION

- Gather materials
- Create a list of 5 groups of children (one group to be the weather recorders each day of the week)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together outside and talk about how they decided what to wear to school that morning.
2. Explain that one of their responsibilities for the school year is to record the daily weather.
3. Ask children to brainstorm what kinds of things need to be recorded on a daily basis. Note their responses on the chart paper.
4. Once children have determined what needs to be recorded, then explain that weather forecasters use specific words to describe different types of weather conditions. These words help everyone understand exactly what is happening with the weather. Usually these are words that describe things that we detect with our 5 senses. That means things that people can see, hear, feel, smell and taste. Discuss if all of these are applicable to weather.

5. Ask children to brainstorm a list of weather words. Write their ideas on chart paper. These should be posted later so children can refer to them as they describe the weather throughout the school year. More words can be added as the seasons change, each time there is a weather event and as the children gain more experience with the weather.
6. Introduce the children's weather notebooks. Explain that each day of the week, it will be one group's turn to record the weather for the rest of the class. They will check the thermometer, the rain gauge and the wind sock to record the important information to report to the rest of the class. They should draw a picture of the weather, including the clouds, as well as describe it using weather words. During the morning meeting, the group will be responsible for reporting to the rest of the class.
7. Divide children into groups and practice together recording the day's weather. Then encourage each group to perform their weather reporting on the day assigned.

NOTE: As the year progresses, the children will become more proficient in recording the weather. Modify the recording technique as the children progress in their thinking. For example, once children figure out how to accurately read the thermometer and record the temperature using numbers, they no longer need the thermometer stamp. Likewise with the rain/snow gauge measurement and the ruler as well as the drawing and the wind speed. Gradually change these as the children grow and develop and hone their recording skills. It is important to also consider individual development as well. One child may be adept at recording the temperature using numbers while another is competent with reading a ruler. Adapt the recording sheet for individuals to best guide their thinking and development in noticing, recording and sharing the weather. Modify recording techniques to best meet the developmental levels and skills of the children in your care.

As children gather weather information throughout the year, it is important to refer them back to earlier entries in the weather notebooks. As they become more proficient at collecting data, they will have more time to compare weather phenomena throughout the year. Asking questions that will challenge and stretch thinking will be important throughout this process. Guide children toward making discoveries about the patterns in weather and seasons.

QUESTIONS FOR DISCUSSION

- What do we need to record so we know what the weather is every day?
- What are some weather words that would help us describe the weather?
- How does the weather change each day?
- What is the weather like today?
- What do clouds tell people about the weather?
- How can you use the clouds to help predict the weather?

ASSESSMENT

Weather Notebook	Accurately recorded temperature, wind speed, cloud cover and precipitation using developmentally appropriate drawing and writing	Accurately recorded temperature, wind speed, cloud cover or precipitation using developmentally appropriate drawing and writing
Weather Reporting	Group accurately presented all aspects of the weather to class	Group accurately presented most aspects of the weather to class

LEARNING CENTER EXPERIENCES

ART—Each season, provide magazines, scissors and glue for children to create a seasonal collage. These collages may include pictures of clothing children wear during that season, people doing different things according to the season and/or animals in the wild during the season.

BULLETIN BOARD—Create a class mural during each season or for each month of the school year. Provide a large piece of paper cut to fit the bulletin board. Create a horizon line along the middle of the paper depicting accurate colors for the season. For example, summer might have a blue sky and green ground, winter might have a blue sky and white ground. Provide children with smaller pieces of paper (depending upon the size of the bulletin board maybe as small as 3″ or as large as 6″). Challenge them to consider the size of people, plants and animals in comparison with the background you have created. Ask that they create people, plants (including trees) and animals doing what they do during that season. Provide scissors for children to cut out their creations and place them appropriately on the background. This could be a center set out for a week or more allowing children ample time to create and add to the ideas others created as well.

MATH/MANIPULATIVES—Provide pictures of thermometers displaying various temperatures and pictures of people dressed for different weather. Challenge children to match people with temperatures appropriate for the clothing they are wearing.

MATH/MANIPULATIVES—At the end of each month or throughout the month, provide a graph or chart for children to record temperature and rainfall. These can change as the children become more proficient at recording the weather.

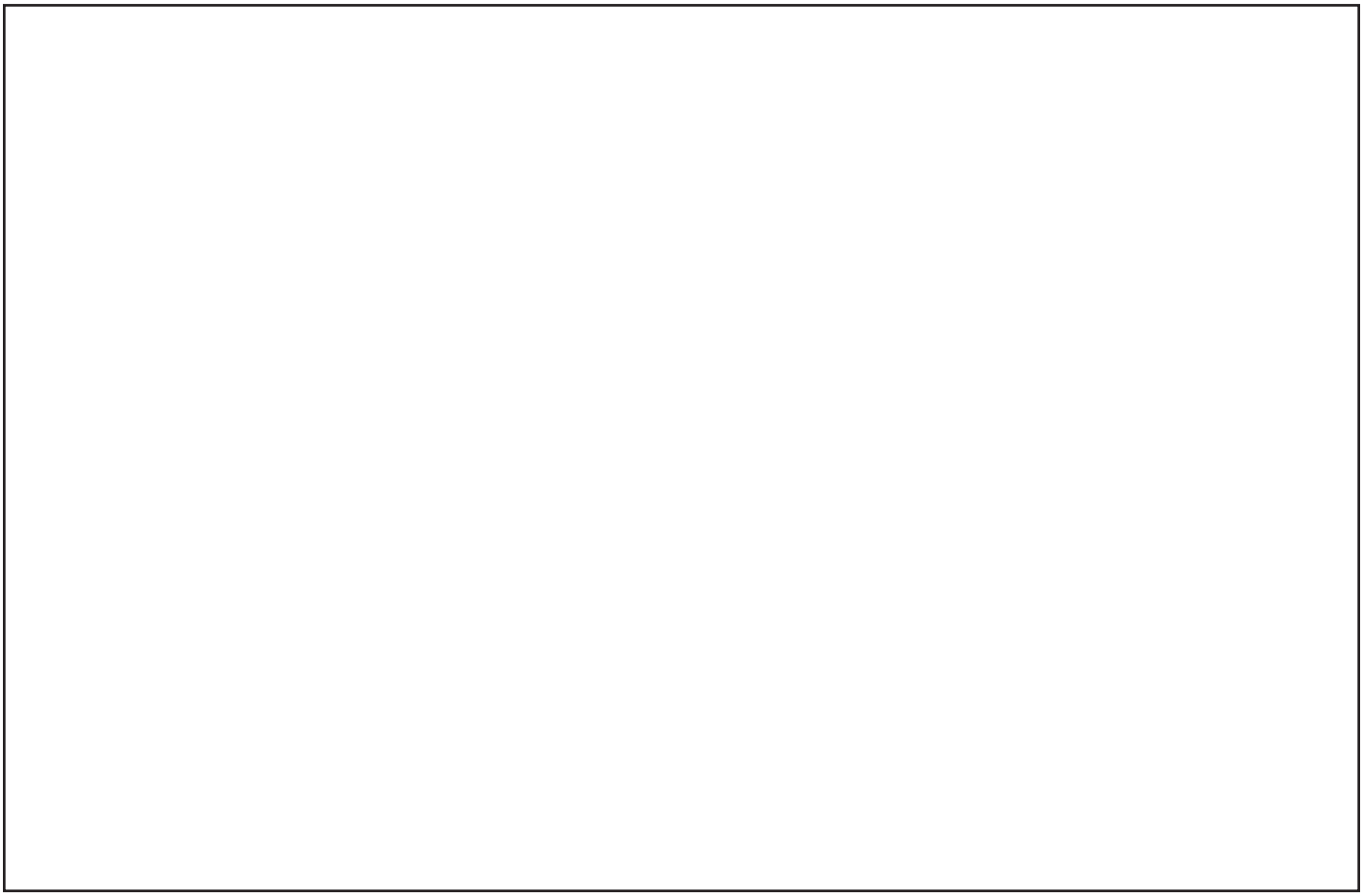
STORY—Read through *See How the Turkey Grows* as a class and talk about all of the different changes that happen throughout the story. Talk about how the author's words and artist's illustrations help the reader to figure out what time of year it is in the story.

HOME AND SCHOOL CONNECTION—Encourage the children to watch or listen to a weather report on the day they report the weather to the class.

HOME AND SCHOOL CONNECTION—Interview community members to compile a list of weather sayings and what they mean. As the weather is monitored, check the sayings for accuracy. Assemble the sayings and their meanings into a class book. All seasons could be combined or one created of weather sayings for each season.

WEATHER OBSERVATION

Date: _____



Draw the weather.

Describe the weather.

_____

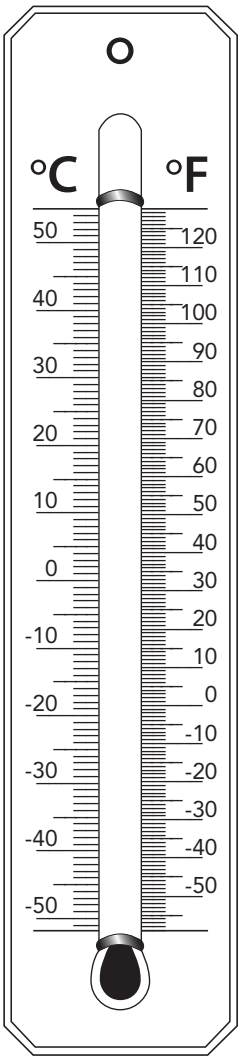
_____

_____

_____

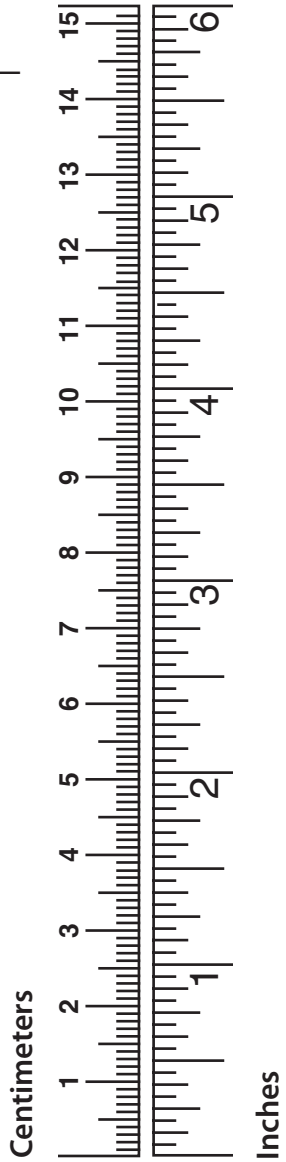
Record the temperature.

_____



Record the precipitation.

_____



Record the wind.

_____

HOST A CATERPILLAR

CHILDREN PARTICIPATING IN THE LEARNING EXPERIENCE WILL

- Observe the growth of a caterpillar
- Feed and care for a caterpillar
- Record data about the caterpillar
- Observe the process of the caterpillar becoming a moth or butterfly

GLES ADDRESSED

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., butterfly, ~~frog, chicken, snake, dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., butterfly, ~~dog, frog, chicken, snake~~)

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

MATERIALS

- Caterpillars native to Missouri
- Large, clear plastic container to keep caterpillars
- Small jar with holes in lid for caterpillar food
- Paper towels cut to fit in bottom of the plastic container
- Hand lenses
- Rulers
- Caterpillar notebooks
- Pencils

TEACHER PREPARATION

- Determine how best to procure caterpillars. Sometimes it is easiest to send home a note to parents asking if anyone finds a caterpillar to bring it in along with the food plant it is found upon. The difficulty here is that sometimes the food plant doesn't come in, and then it is difficult to identify the caterpillar. Another possibility is to scout the outdoor classroom or play area to see what kinds of caterpillars might be readily available. Any type of milkweed is likely to have monarch caterpillars. They are yellow, black and white striped with antennae on both front and back. They are easy to spot. They usually hang out on the backs of the leaves, and there is generally only one per plant. Don't collect the milkweed tussock moth caterpillar (also yellow and black and white but fuzzy). There are often many of these together and they overwinter in their cocoons so the process takes longer. If you cannot locate monarch caterpillars, black swallowtails are often easy to spot on any herb or plant that is part of the carrot family. In gardens, look on dill, parsley and fennel. In the wild, look on the bottom leaves of Queen Anne's lace. Question mark caterpillars are often found on elm.

- Giant silk moths emerge in early spring and fall and provide a good source for caterpillars that are fairly easy to raise. These include moths such as the Polyphemus and Luna moths. The moths live only a short time. They are usually active at night near deciduous trees and forests. They are sometimes seen flying around house or porch lights. Females generally have small antennae while male antennae are bushy and feathery (to smell female pheromones). These moths have no mouth parts to eat and live only to reproduce. If a female is captured, place her in a clean, clear container. Watch her for a few days and see if she lays eggs. They are small, about the size of a large pin head. There will be many! The caterpillars will hatch in less than 2 weeks, and they are very tiny as well. Before the caterpillars hatch, research the type of food the caterpillar eats and help the

children identify what that food looks like. Be sure there is access to a great deal of food. These caterpillars eat a lot! Once the caterpillars hatch, place food in the container. For moth caterpillars (unlike butterfly caterpillars), this food does not need to be placed in water containers. Loosely placing the leaves on the bottom of the container is adequate. However, it is important to clean the container daily and change the food. Newly hatched caterpillars are very small, but once they reach ½ inch in size, they should be separated into different containers with only a few caterpillars in each container. If you have enough caterpillars, families often enjoy raising these caterpillars at home as the children watch them at school. Although the caterpillars eat a variety of food, once they are started on one particular food, it is difficult to change them to another. Fall moth caterpillars will probably overwinter in their cocoons, but spring moth caterpillars should emerge in late spring.

- Prepare the butterfly caterpillar habitat. Fill jar with water and secure lid. Insert specific butterfly caterpillar food in holes. This will prevent the caterpillar from falling in and drowning. Place paper towels in bottom of plastic container. These will help collect the frass (caterpillar poop) and keep the container clean. The jar with the food plant can now be placed in the container on the paper towels. A stick propped in the container will also give the caterpillar something to climb on when molting. Monarchs hang from the top of the container when making their chrysalis while black swallowtails prefer hanging from a stick. Lastly, add the caterpillar, placing it on or near the food plant. Put the lid on tight so the caterpillar doesn't escape but make sure there are holes in the lid to allow sufficient air flow for the caterpillar to breath. Do not place the container in direct sunlight. Every few days clean the frass from the container and replace the food.

- Set up a caterpillar observation center. This might include photographs of the moth or butterfly the caterpillar will become, and/or field guides and literature about caterpillars and butterflies/moths.

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together to introduce the classroom guest. Show the children the observation center and tell them your plan for tracking the daily growth and changes of the caterpillar. This might include a chart to record the daily length of the caterpillar. Bar graphs work well as the children don't have to read a ruler but simply measure the caterpillar length with string and replicate the length on the graph. It also might include daily drawings or sketches that can be posted near the caterpillar observation center. Still another possibility would be to provide each child a caterpillar notebook to record individually the daily growth and changes to the caterpillar.
2. Provide time each day for the children to visit the observation center and record what happens with the caterpillar. Encourage them to research about the caterpillar and what will happen as the caterpillar matures.
3. Either take the caterpillar home, or allow children to take it home on the weekends. This will ensure that the caterpillar has food.
4. Once the chrysalis is formed, continue watching. Some chrysalises go through distinct changes before the butterfly emerges. Don't be afraid to learn about your caterpillar along with the children! Newly emerged butterflies can be fed by placing sugar water (1 t. sugar to 1 c. bottled water) on a Q-tip and holding it near the butterfly's proboscis.
5. Hold a butterfly releasing celebration. Talk with the children about all of the changes they observed in the caterpillar and butterfly. Be sure to include a last portrait of the newly emerged butterfly. Go over the various stages of the butterfly life cycle—egg, larva (caterpillar), pupa (chrysalis) and adult (butterfly).

QUESTIONS FOR DISCUSSION

- How is the caterpillar like a butterfly?
- How do you know it will become a butterfly?
- What do caterpillars need to survive?

ASSESSMENT

Caterpillar Notebook Entries	Accurately recorded growth of the caterpillar and development of chrysalis and butterfly as developmentally appropriate	Recorded growth of the caterpillar and development of chrysalis and butterfly with only a few inaccuracies as developmentally appropriate	Notebook did not reflect accurate recording of growth of caterpillar or development of chrysalis or butterfly

LEARNING CENTER ACTIVITIES

ART—Provide an array of materials (egg cartons, pipe cleaners, coffee filters, construction paper, clothespins, markers, glue, etc.) for children to create caterpillars and butterflies.

ART—Talk with the children about things in nature that are symmetrical, like the butterfly's wings. Challenge them to make symmetrical paintings by folding the paper in half. Squeeze thick paint out of bottles in designs on one side of the paper. Fold the paper and squish both sides together. Open the paper to symmetrical art!

MATH/MANIPULATIVE—Challenge children to put pictures of the process from egg to butterfly in order.

READING—Encourage children to carefully look through the illustrations in *See How the Turkey Grows* to find chrysalises or cocoons hidden in the plants.

SCIENCE—Provide model magic to encourage children to recreate the stages of the butterfly life cycle. Color the model magic with permanent markers and place in a box or on a tray for display purposes.

WRITING—Provide small books sewn together for children to create caterpillar-to-butterfly stories.

OUTSIDE—Look for caterpillars eating on plants in your play area. Caution children to leave caterpillars in place as often the plant is a clue as to what kind of caterpillar it is.

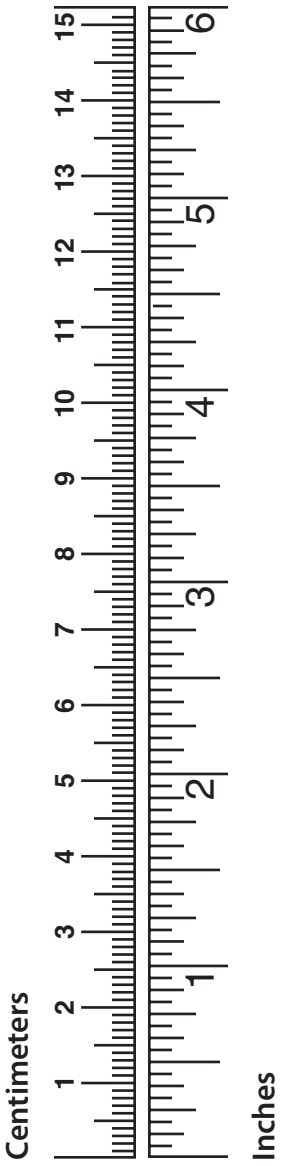
MUSIC—Teach the children the following song to the tune of *Twinkle Twinkle Little Star*:

My friend little caterpillar *(pet thumb)*
Eats green leaves until they fill her.
Then she grows a chrysalis. *(make fist with thumb in middle)*
There she changes unseen by us.
Time will pass, and by and by
she'll become a butterfly. *(put thumbs together and flap hands)*

My friend little caterpillar *(pet thumb)*
Eats green leaves until they fill her.
Then she spins a small cocoon. *(make fist with thumb in middle)*
There she sleeps and very soon…
Time will pass, and she'll fly off.
She'll become a fuzzy moth. *(put thumbs together and flap hands)*

CATERPILLAR OBSERVATIONS

Draw a picture of the caterpillar.



How big is the caterpillar?

What discoveries have you made?

WILDFLOWER COLLECTION

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Discuss what wildflowers need to survive
- Sketch wildflowers
- Compare structures of different wildflowers
- Sketch and label parts of a wildflower

GLES ADDRESSED

LO.1.D.K.a Observe ~~and compare~~ the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~
LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, ~~seeds~~, roots)

MATERIALS

- An area with wildflowers that children are allowed to pick
- Chart paper
- Marker
- Two different wildflowers pulled up by the roots
- Missouri wildflower field guides (optional)
- Hand lenses
- Colored pencils
- Science notebook pages
- Digital camera (optional)

TEACHER PREPARATION

- Scout site for wildflowers and potential dangers
- Collect at least 2 different wildflowers, including the roots. If one of the wildflowers is Queen Ann's lace, the root smells like carrot (It is wild carrot.) and is an interesting smell for children to experience.
- Gather supplies
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside in an area readily accessible to wildflowers. Invite children to notice all of the colors and smells around them. Challenge them to consider what needs to be there for the wildflowers to survive. Make a list of their ideas on chart paper. Guide them to consider air, water and light.
2. Share the wildflowers collected. Challenge the children to compare the two and see what they have in common. At first they may focus on things like color and smell, but guide them to look at the parts of the plants, specifically roots, stems, leaves and flowers. While talking make a quick sketch of the wildflowers collected, and label these parts as the children name them. Many teachers don't like to draw in front of the children, but remember the message sent to children when adults say they can't draw. If we expect children to draw and want to draw, adults must model this for them, just as we do reading and writing.
3. At this point, talk with children about how many people like to enjoy wildflowers. When they are picked, they die, and not very many people get to enjoy them. So everyone can still enjoy the wildflowers, the children are going to use drawings to study the wildflowers.

4. Challenge children to find a different wildflower in the outdoor environment. They should use their colored pencils to sketch it and label the parts that they can see it has in common with the wildflowers the class examined.
5. Encourage children to spread out and begin their sketching.
6. After everyone is finished, encourage them to share their sketches.

QUESTIONS FOR DISCUSSION

- What parts does the wildflower you sketched have?
- How does the plant use each of these parts?
- How are flowers and trees alike? Different?

ASSESSMENT

Wildflower Drawing	Drawing is an accurate representation of the flower as developmentally appropriate	Drawing is partly accurate but also contains some inaccurate parts as developmentally appropriate	Drawing is not based on actual wildflower
Wildflower Labeling	Labeling accurately included roots, stem, leaves and flower as developmentally appropriate	Labeling accurately included 2 of the following: roots, stem, leaves, flower as developmentally appropriate	Labeling accurately included at least 1 of the following: roots, stem, leaves, flower as developmentally appropriate

LEARNING CENTER ACTIVITIES

READING—Look for wildflowers at different stages of growth and development throughout *See How the Turkey Grows*.

SCIENCE—Provide pictures of wildflowers and laminated pressed wildflowers and challenge children to match them.

OUTSIDE—Provide pictures of wildflowers on cards and challenge children to find them on a scavenger hunt outside.

Draw a wildflower and label the roots (if you can see them), stem, leaves, flower and seeds (if you can see them).

FALL

PLANT OR ANIMAL

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Brainstorm the differences between plants and animals
- Look for and identify plants and animals in an outdoor area
- Record 2 plants and 2 animals in their science notebook pages using words and drawings

GLES ADDRESSED

LO.1.D.K.a Distinguish between plants and animals based on observable structures and behaviors
SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~
SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings and maps, ~~data tables~~, ~~graphs (bar, pictograph)~~, writings

MATERIALS

- Science notebook pages
- Digital camera (optional)
- 2 pieces of chart paper
- Safe area around school to explore
- Marker
- Pencils

TEACHER PREPARATION

- Scout areas where children might find insects—under rocks, in leaf litter, etc.
- Gather science notebook pages and pencils
- Divide one piece of chart paper in half labeling one side "Plants" and the other "Animals"
- Divide other piece of chart paper in half labeling one side "Ways plants and animals are alike" and the other side "Ways plants and animals are different"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside to prepare them for the investigation. Ask the children to name plants that they know. These might be trees, plants in the classroom, flowers, etc. Then ask them to name some animals.
2. Brainstorm along with children how plants and animals are alike or similar and how they are different. Record their ideas on the chart. When children provide inaccurate information, ask for further explanation to understand their thinking. Ask for consensus from the group before adding each plant/animal to the chart. When children are unsure, ask where they might go to find out.
3. Discuss with the children where they might find plants and animals in areas where they play.
4. Ask the children to get out their scientist eyes to investigate the playground or outdoor classroom. They are going to look for plants and animals. Ask each child to find and draw at least 2 plants and 2 animals. After drawing them, ask children to write under each drawing how they determined whether it was a plant or animal.
5. If there are area rules, these should also be discussed prior to beginning the investigation.
6. Allow the children to explore the outdoor space. Outside, the teacher can record the children's investigations with the camera, taking pictures of the plants and animals they discover. Talk with children as they work asking questions about their findings.
7. Once all of the children have recorded their ideas, gather them as a group. Use the second piece of chart paper to record their findings, encouraging them to use their science notebook pages to help them remember what they recorded.
8. Talk about each plant or animal added to the chart and how the children decided whether it was a plant or animal.

QUESTIONS FOR DISCUSSION

- How do you know when something is a plant or animal?
- How do plants get food? How do animals get food?
- What do plants need to live? What do animals need to live?
- What did you notice in the environment that would help your plant or animal survive?

ASSESSMENT

Discussion	Participated during initial discussion and accurately named at least one plant and one animal	Participated during initial discussion but accurately named either a plant or an animal	Did not participate in discussion but listened attentively
Outside	Found and shared at least one plant and one animal	Found and shared one plant or animal	Actively looked for plants and animals
Science Notebook	Recorded using developmentally appropriate drawing and writing 2 plants and 2 or more animals	Recorded using developmentally appropriate drawing and writing 1 plant and 1 animal	Recorded using developmentally appropriate drawing and writing either a plant or an animal
Final Discussion	Accurately named 2 or plants and 2 or more animals found during the investigation to be included on the chart	Accurately named 1 plant object and 1 animal found during the investigation to be included on the chart	Accurately named either a plant or an animal to be included on the chart

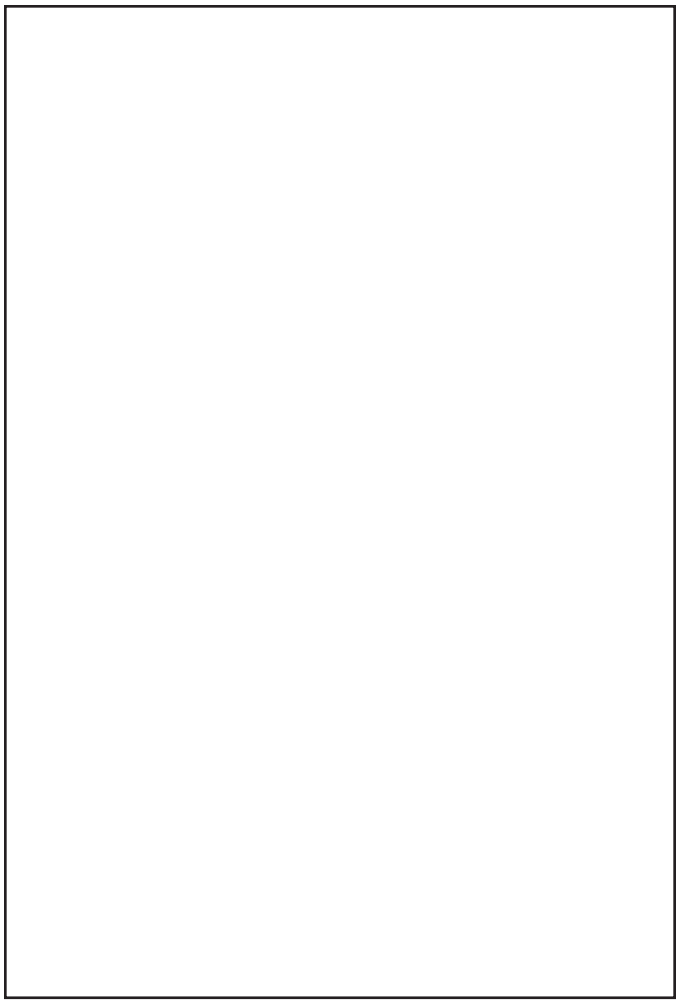
LEARNING CENTER ACTIVITIES

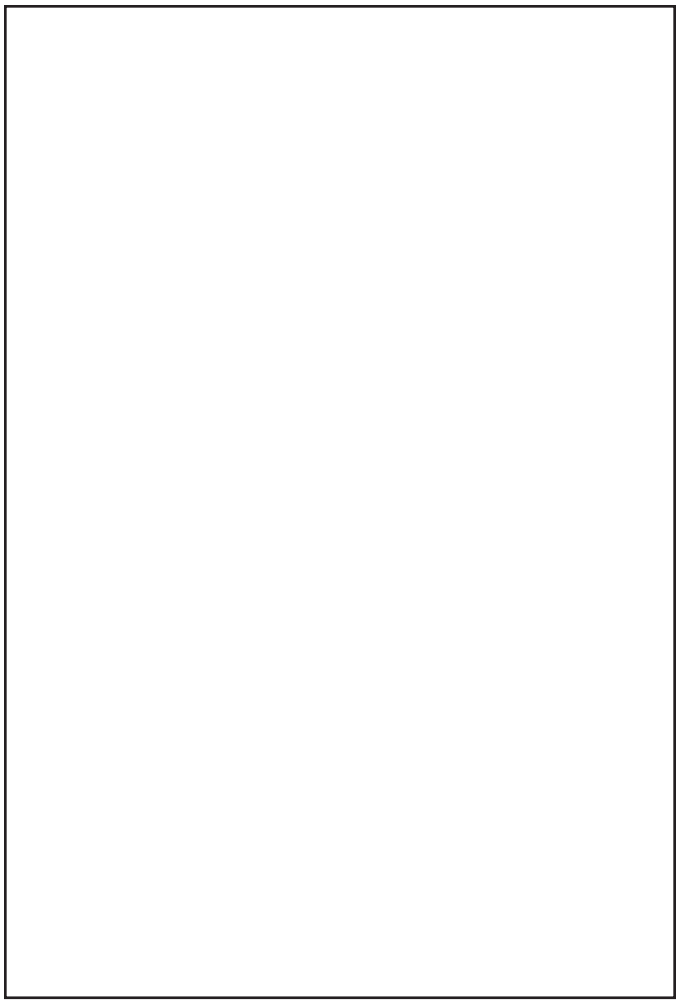
MATH/MANIPULATIVES—Sort plant and animal cards into plants and animals.

READING—Identify plants and animals throughout *See How the Turkey Grows*. Ask children to locate any that appear in the story and are also in their outdoor area.

SCIENCE—Create a map of the area including permanent features. Once map is completed, designate where plants and animals were found.

PLANTS





Draw 2 plants that you found.

How do you know each is a plant?

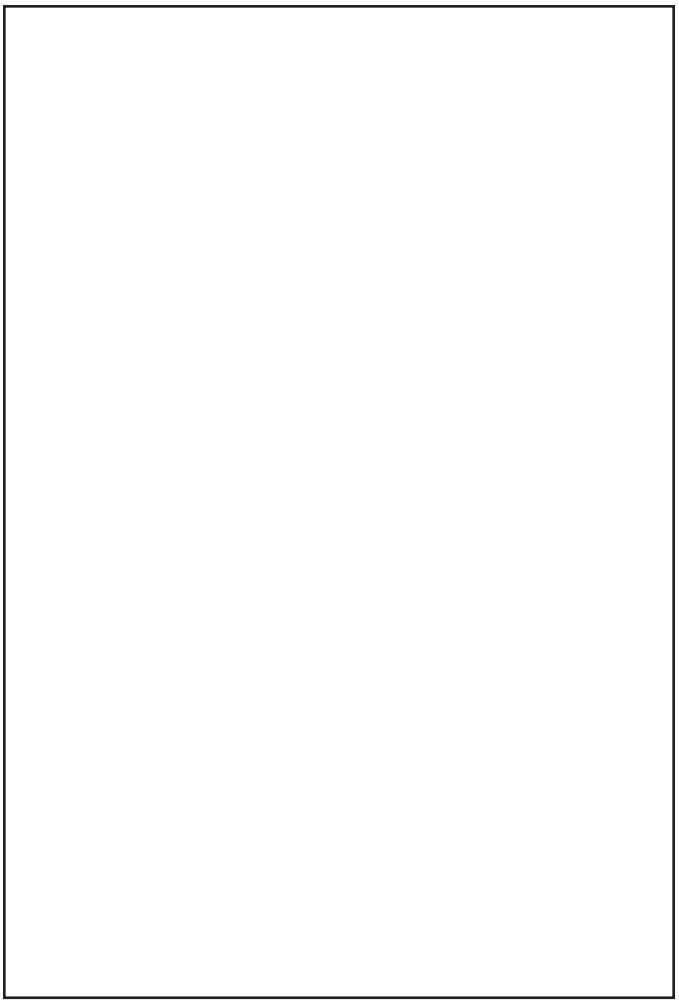
_____ _____

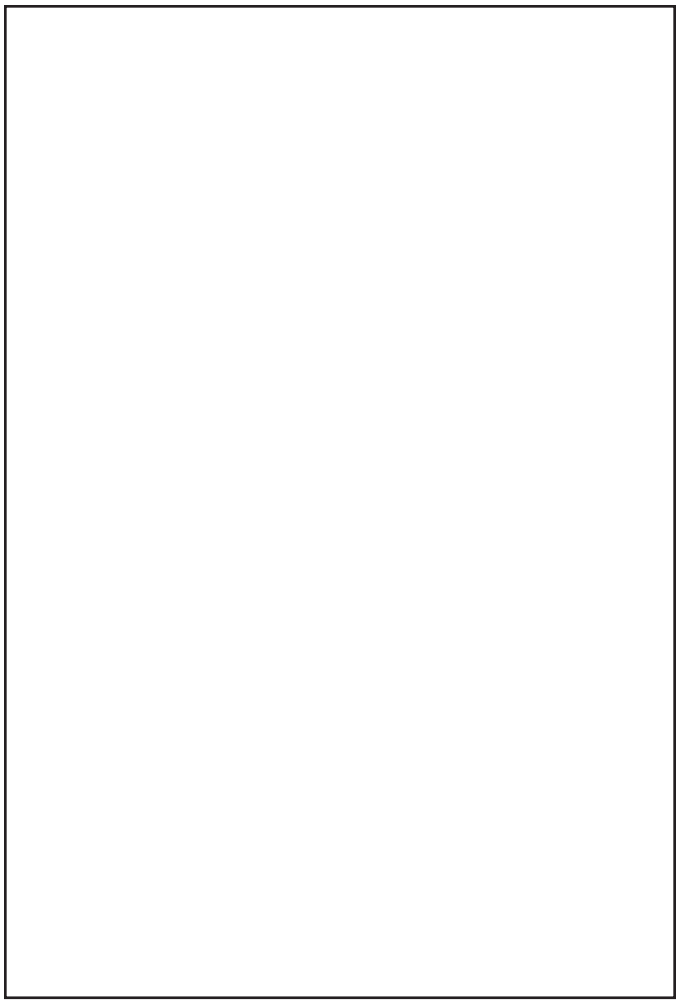
_____ _____

_____ _____

_____ _____

ANIMALS





Draw 2 animals that you found.

How do you know each is an animal?

_____ _____

_____ _____

_____ _____

_____ _____

FALL TREE PORTRAITS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Discuss seasonal changes associate with fall
- Explore trees in the fall
- Identify some of the ways trees change from summer to fall
- Create a fall tree painting
- Record fall tree facts

GLES ADDRESSED

LO.1.A.1.b Describe the basic needs of most plants (i.e., air, water, light)
EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~
UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, fall, ~~winter~~, ~~spring~~)

MATERIALS

- Fall day
- The same outdoor area visited during the summer tree portraits
- Pictures of animals that live in trees (squirrel, raccoon, bird, etc.)
- Chart paper
- Markers
- Watercolor paper
- Crayons
- Watercolors
- Water cups
- Small paint brushes

TEACHER PREPARATION

- Select an outdoor area and a place where children may work
- Gather supplies

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together outside in the sunshine.
2. Ask how they know it is fall. Record their ideas on the chart paper.
3. Brainstorm a list of seasonal changes that have occurred in the outdoor space.
4. Encourage children to think about what trees and other plants need to survive. Discuss the availability of these elements during the fall.
5. Remind the children of their summer tree drawings. Ask how the trees have changed.
6. Talk about the tree parts that are still there (roots, stem or trunk, branches). Some even may still have their leaves and seeds.
7. Remind children of when they pretended to be a tree in the summer. Tell them that they are going to repeat that experience but now it is fall. They should think about how they have changed (as a tree) since summer. If it isn't too cold, ask children to take off their shoes and socks and be the tree. Tell them to stand up with their toes digging into the grass. Feel their roots holding on to the soil. Think about moving up through their trunk. They should lift their branches (arms) high into the sky, swaying

as the wind rustles through them. Or maybe they are dropping their leaves. The branches are letting the leaves and seeds go to slowly float down to the ground. Perhaps their tree hangs on to its leaves until spring, but the leaves turn brown and crispy in the fall. Make their fingers wiggle like they are crispy leaves being tickled by the wind. Close their eyes and be a tree!

8. Encourage children to return to the tree they drew in the summer. This time, instead of colored pencils, ask that they draw the tree using crayons, making sure to include all of the parts of the tree they observe. Once the tree is drawn, the color can be filled in with watercolors. Other environmental phenomena that are in the immediate environment may be added to the picture depicting things the tree needs to survive, animals and people using the tree or plants around the tree.
9. When they are finished with their tree portraits and the paint is dry, ask them to turn it over and write 3 facts about trees in fall.
10. Display their trees in autumn paintings then save them for later reflection.

QUESTIONS FOR DISCUSSION

- How do you know it is fall?
- What has changed in our outdoor environment?
- How do the trees look different? The same?
- Why are the trees changing?

ASSESSMENT

Discussion	Participated during initial discussion and stated 3–4 seasonal changes associated with fall	Participated during discussion and stated 1–2 seasonal changes associated with fall	Did not participate in discussion but listened attentively
Tree Drawing	Painting of tree included roots, tree trunk, branches and leaves depicted in fall as developmentally appropriate	Painting of tree included some but not all parts of the tree depicted in fall as developmentally appropriate	Painting of tree did not resemble tree or was not depicted in fall
Writing	Wrote 2 or more accurate facts about trees in fall as developmentally appropriate	Wrote 1 accurate fact about trees in fall as developmentally appropriate	Wrote about trees but inaccurate information

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Create a memory or matching game using pictures of trees in the outdoor area taken in the summer and the same trees taken in fall.

READING—Read *See How the Turkey Grows* with the children. Ask children to identify the parts of the story that take place in the fall. Talk about clues that help them know it is fall in the story. Discuss how the trees in the story depict the time of year.

MUSIC—Teach the children the following song to the tune of *I'm A Little Teapot*. Discuss ways trees help the fox squirrel survive (food, shelter) and how the fox squirrel helps the trees (seed distribution and planting).

I'm a little fox squirrel, red and brown.	*(put hands behind back like a squirrel tail)*
I eat nuts that I have found.	*(pretend to eat nuts)*
I pick them up and bury them deep.	*(pretend to pick up nuts and bury them)*
When winter time comes I'll have lots to eat.	*(rub tummy)*

LEAFY DESCRIPTIONS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Describe seasonal changes
- Discuss how seasonal changes affect the trees
- Discuss the leaf's job in helping the plant
- Collect leaves
- Brainstorm a list of scientific words to describe leaves
- Accurately depict a leaf through drawing and writing

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~
LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem~~, leaves, ~~flowers~~, ~~seeds, roots~~)
EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~
EC.1.A.K.B Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)
UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, fall, ~~winter, spring~~)
SI.1.B.K-3.a Make qualitative observations using the five senses
SI.1..B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets, equal arm balances, thermometers~~)
SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

MATERIALS

- Chart paper and marker
- Bags (1 per child)
- Hand lenses (1 per child)
- Science notebook pages
- Pencils
- Colored pencils or crayons [primarily leaf tones—browns, reds, oranges, yellows, greens, grays, blacks (markers don't work well for this experience as they don't usually come in a variety of shades)]

TEACHER PREPARATION

- Scout leaf collection area for poison ivy so you know areas to avoid
- Prepare one long piece of chart paper with 6 columns labeled "Seeing," "Hearing," "Tasting," "Touching," "Smelling" and "Other"
- Label bags (plastic or paper) with children's names
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside and discuss what time of year it is and how they know. Write their ideas about how the weather and environment is changing on the chart paper.
2. Once they have generated a list of seasonal changes, ask about how this affects them. Discuss their bedtimes, changes in their clothing choices, how their families are preparing for winter, etc.

3. If the children have not already talked about it, point out that one of the changes in the fall is that tree leaves are turning colors and falling to the ground. As days become shorter and temperatures cool, trees begin to shut down their food production. The leaf's job is to make food for the tree. During the winter, the tree doesn't make food so it doesn't need its leaves.
4. Following this discussion, pass bags out to children. Suggest that they collect leaves that they are interested in studying or leaves that they think are particularly beautiful. Allow children to gather leaves and suggest that they try to figure out which leaf came from which tree.
5. Once children have collected a bag of leaves, bring them back together in the original meeting spot. Talk with them about how scientists use words that are very descriptive to share observations. Brainstorm a list of descriptive or fact-based words that depict their leaves in a way that others will be able to picture the leaf. Write their descriptive words on a clean piece of chart paper. Talk about any that are subjective or opinions rather than descriptive.
6. After completing this list, talk with the children about how these words describe the way we use our five senses to look at the leaves. Pull out the chart that was prepared with the five senses listed across the top. Go through each sense and take the words off the list that best fit under that category. Add more to the list under each sensory category as children share more ideas.
7. Display this completed chart in a manner that the children can see it. Distribute hand lenses, science notebook pages and colored pencils or crayons.
8. If children have not used hand lenses before, demonstrate how to use them to look more closely at their leaves. Hold the lens close to the eye and move the leaf up to the lens.
9. Ask children to select their favorite leaf and get to know the leaf; for example, count the number of points or lobes, note places animals have nibbled the leaf, look for interesting coloring, etc. Suggest that they use the hand lens to see the intricacies of the leaf, looking for places that hint at things that happened to the leaf during its time on the tree or the ground.
10. Once children have gotten to know their leaves, they can create a leaf portrait in their science notebook pages and write a description using sensory science words. They should select words that will help the reader get a picture of the leaf in their minds. These might be taken from the chart created by the class or new words that could be added to the chart later.
11. As they finish, suggest that children share their leaf drawings and descriptions with a peer, challenging the peer to pick the leaf depicted in the science notebook pages from two or three others in the child's bag.

QUESTIONS FOR DISCUSSION

- What time of year is it? How do you know?
- What is happening at your house because of the seasonal changes?
- What happens to the plants during this time of year? Why?
- How will you decide which leaves to pick up?
- What words could you use to describe some of your leaves?
- What makes your favorite leaf different from the others? What makes it special?

ASSESSMENT

Discussion	Contributed ideas about seasonal changes	Participated during discussion but did not share any new ideas	Did not participate in discussion but listened attentively
Leaf Collection	Collected a variety of leaves		Collected minimal or no leaves due to distractions
Sensory Science Words	Contributed to discussion adding sensory science words to describe leaves	Contributed to discussion adding no new sensory science words to describe leaves	Listened but did not contribute to the discussion
Hand Lens Use	Hand lens was used to assist in examining the leaf	Hand lens was used but not effectively	Hand lens was not used
Science Notebook Drawing	Leaf illustration accurately depicts details of leaf including color, shape and irregularities as developmentally appropriate	Leaf illustration depicts details of leaf including color, shape and irregularities with some inaccuracies as developmentally appropriate	Illustration shows outline of leaf but no details
Science Notebook Writing	Leaf description included science words to describe the leaf as developmentally appropriate	Leaf description included some science words to describe the leaf as developmentally appropriate	Leaf description included only subjective words to describe the leaf as developmentally appropriate

LEARNING CENTER ACTIVITIES

ART—Provide glue and paper for children to make leaf collages with leaves collected. These can be arranged between two pieces of clear contact paper or laminated to produce a leaf sun catcher.

ART—Demonstrate how to make leaf silhouettes by placing a leaf on a piece of paper, sponge or spatter painting over the leaf and then remove it. Encourage children to experiment with the technique.

ART—Provide fabric or acrylic paint for children to create leaf print shirts or other articles of clothing.

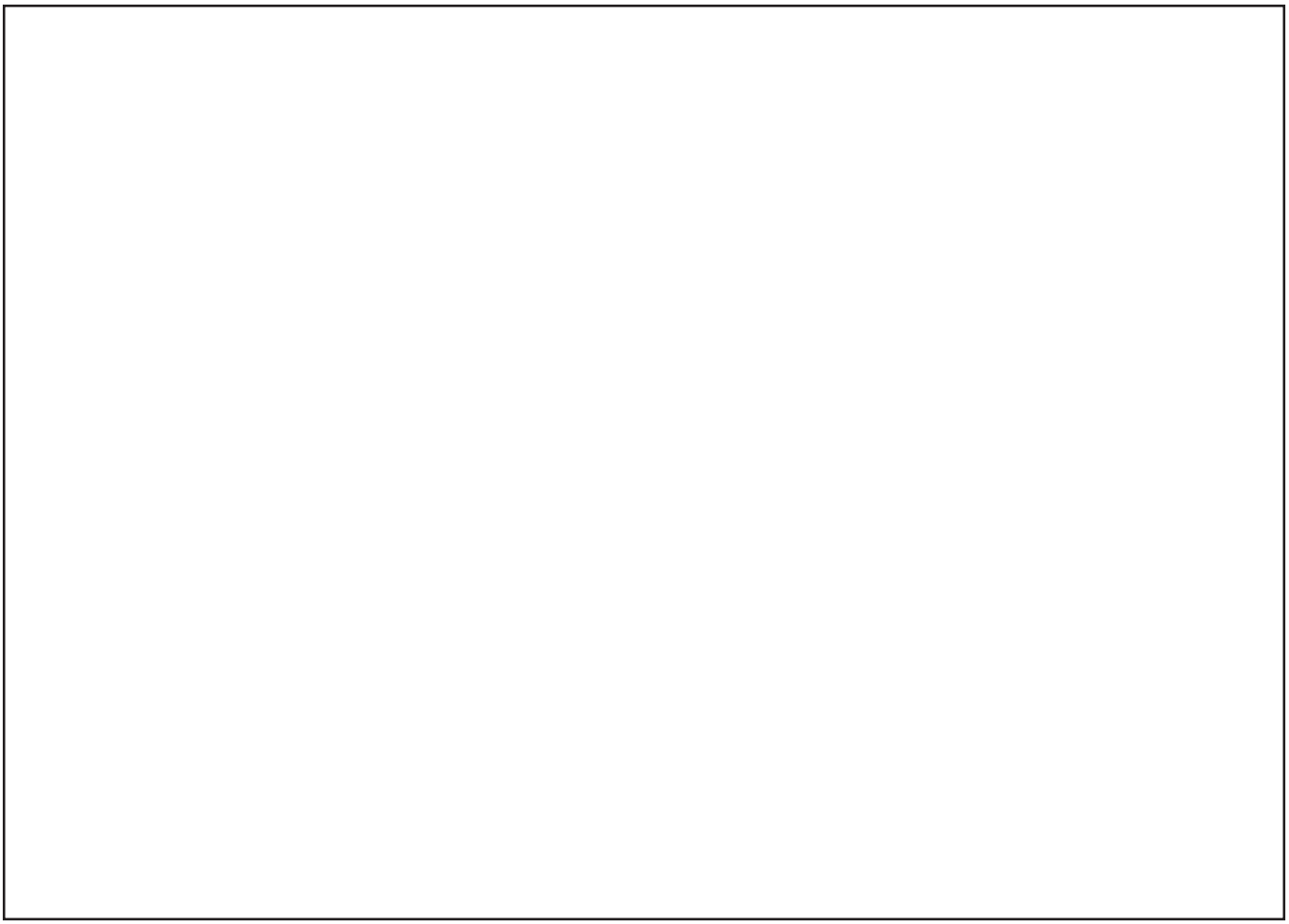
ART—Demonstrate how to make leaf foil prints by placing aluminum foil over leaves and rubbing with the side of a pencil or fingertips. Provide materials for children to create their own.

BULLETIN BOARD—Make a bulletin board display of leaf rubbings from a variety of leaves. Under each rubbing, place a small piece of Velcro. Laminate the leaves and attach the opposite pieces of Velcro to the leaves. Place the leaves in a pocket on the bulletin board. Encourage children to place each leaf under its rubbing.

MATH/MANIPULATIVE—Make a leaf memory or concentration game for children by placing leaves on cards and laminating. Be sure to include two of each type of leaf.

MATH/MANIPULATIVE—Provide materials for children to sort leaves by size, texture, insect damage, color, smell, etc. Be sure to include chart paper to chart the number of each category.

LEAF PORTRAITS



Draw your leaf.

Describe your leaf using science words.

_____

_____

_____

_____

TREE PUZZLE

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify the parts of a tree
- Discuss the function of each part of the tree
- Draw a tree and label the parts

GLES ADDRESSED

LO.1.D.1.K.a Observe ~~and compare~~ the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~.
LO.1.D.1.a Identify ~~and compare~~ the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots)
LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, reproduction)

MATERIALS

- Flannel or felt board
- Felt tree puzzle parts—roots, trunk, leaves (all seasons)
- Felt fruit and/or nuts
- Felt labels of tree parts—roots, trunk or stem, leaves, flowers, seeds
- Felt birds, bird nests, squirrels, squirrel nests, etc. (optional)

TEACHER PREPARATION

- Copy the included patterns and use them to cut out felt pieces in appropriate colors
- Set up the flannel board as a center, including the children's science notebook pages in the center

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Set up the felt or flannel board as a center for children to use individually or in small groups. Place the pieces in an open container near the flannel board.
2. As children engage in the center, challenge them to put the tree together while working either individually or in small groups. Felt labels can be used to label the various plant parts of the tree. Felt pieces could also be sorted into parts on the flannel board.
3. Encourage the children to talk about the function of each part of the tree.
4. The animals can be added to the tree puzzle as children begin to discuss how trees help people and animals.

QUESTIONS FOR DISCUSSION

- Why do trees need all of these parts?
- How do each of these parts help the tree?
- How are all trees alike? Different?
- How are trees like other plants?

ASSESSMENT

Flannel Board Work	Accurately put the tree puzzle together	Accurately put the tree puzzle together with some assistance	
	Matched 4–5 labels with tree parts	Matched 2–3 labels with tree parts	Matched 1 label with tree part
	Accurately described with peers or teacher the function of 4–5 tree parts	Accurately described with peers or teacher the function of 2–3 tree parts	Accurately described with peers or teacher the function of 1 tree part

LEARNING CENTER ACTIVITIES

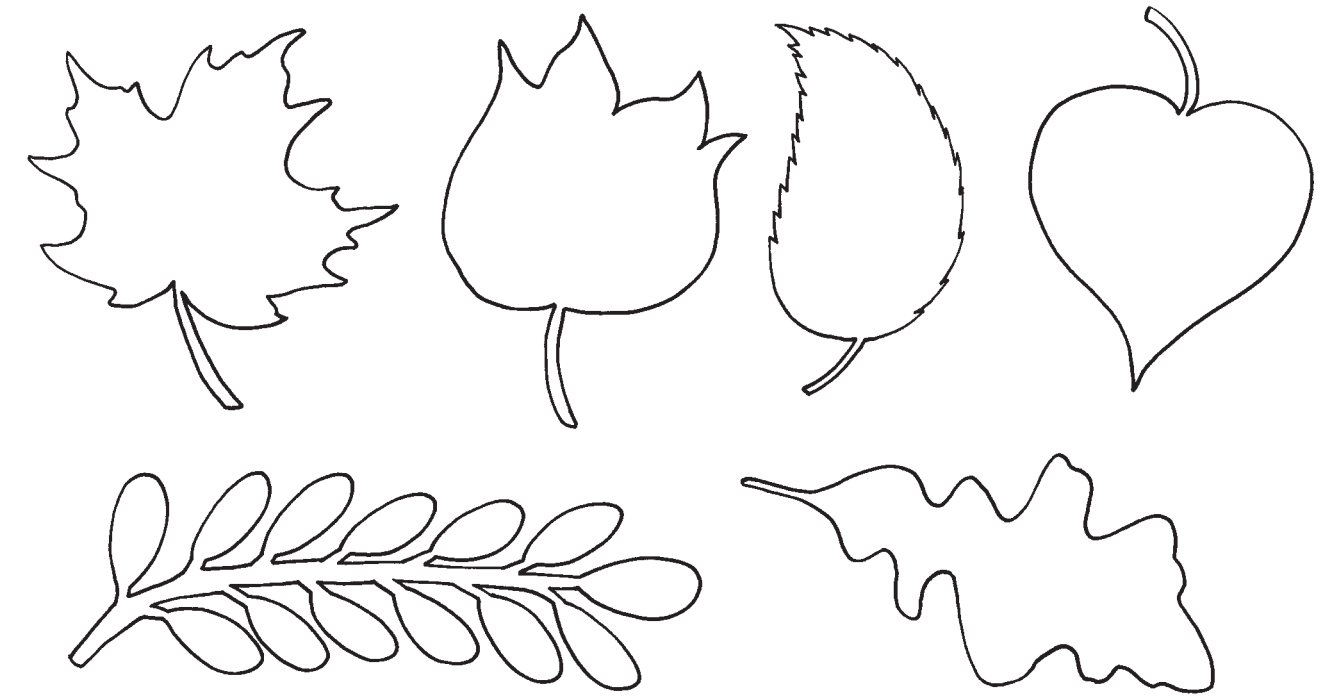
ART—Put out brown construction paper, tissue paper, torn construction paper, etc. Ask children to create tree pictures during center time. Vary the materials depending on the season and the children's ideas.

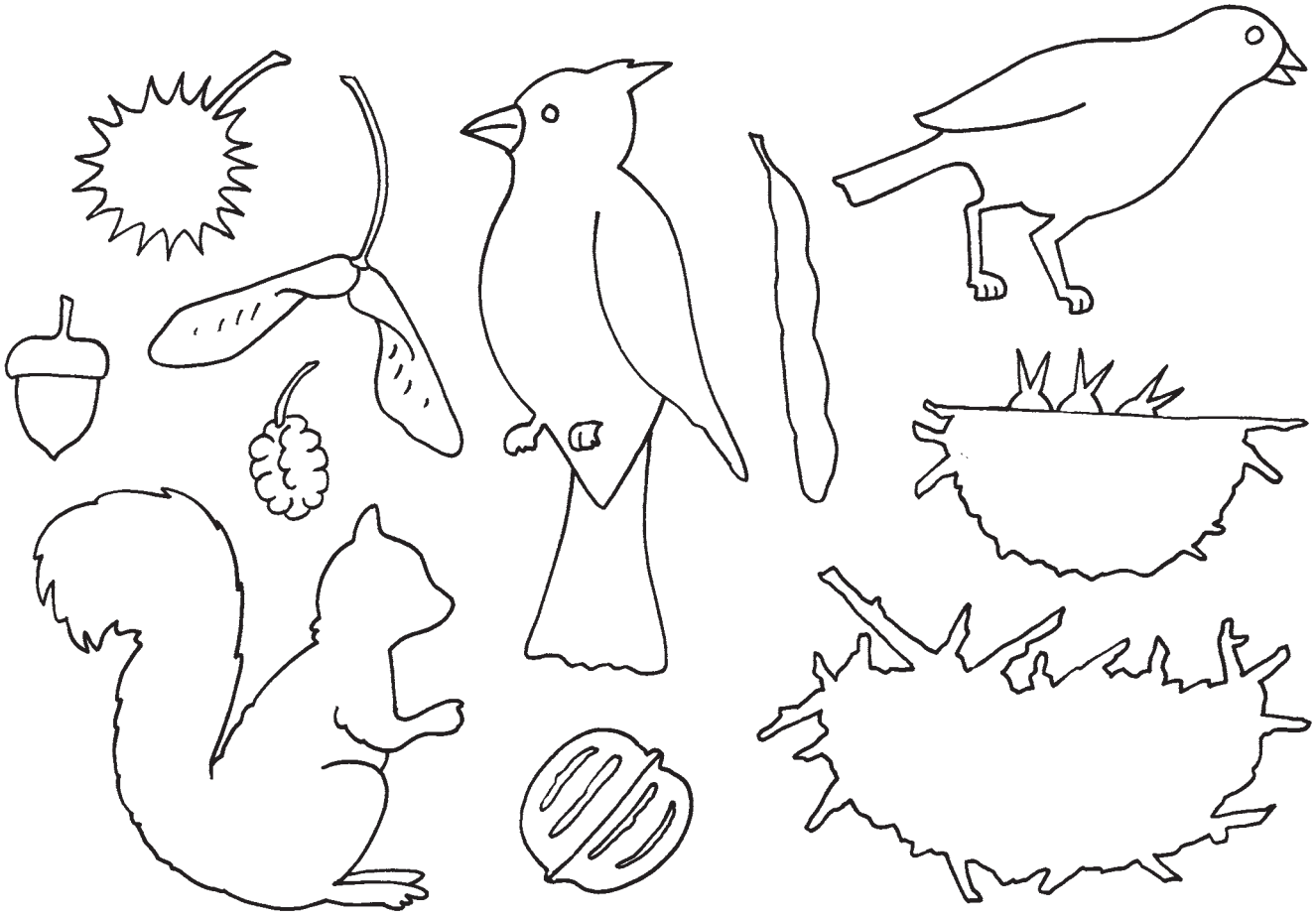
SCIENCE—Provide science notebook pages for children to draw and label the parts of the tree after putting together the puzzle.

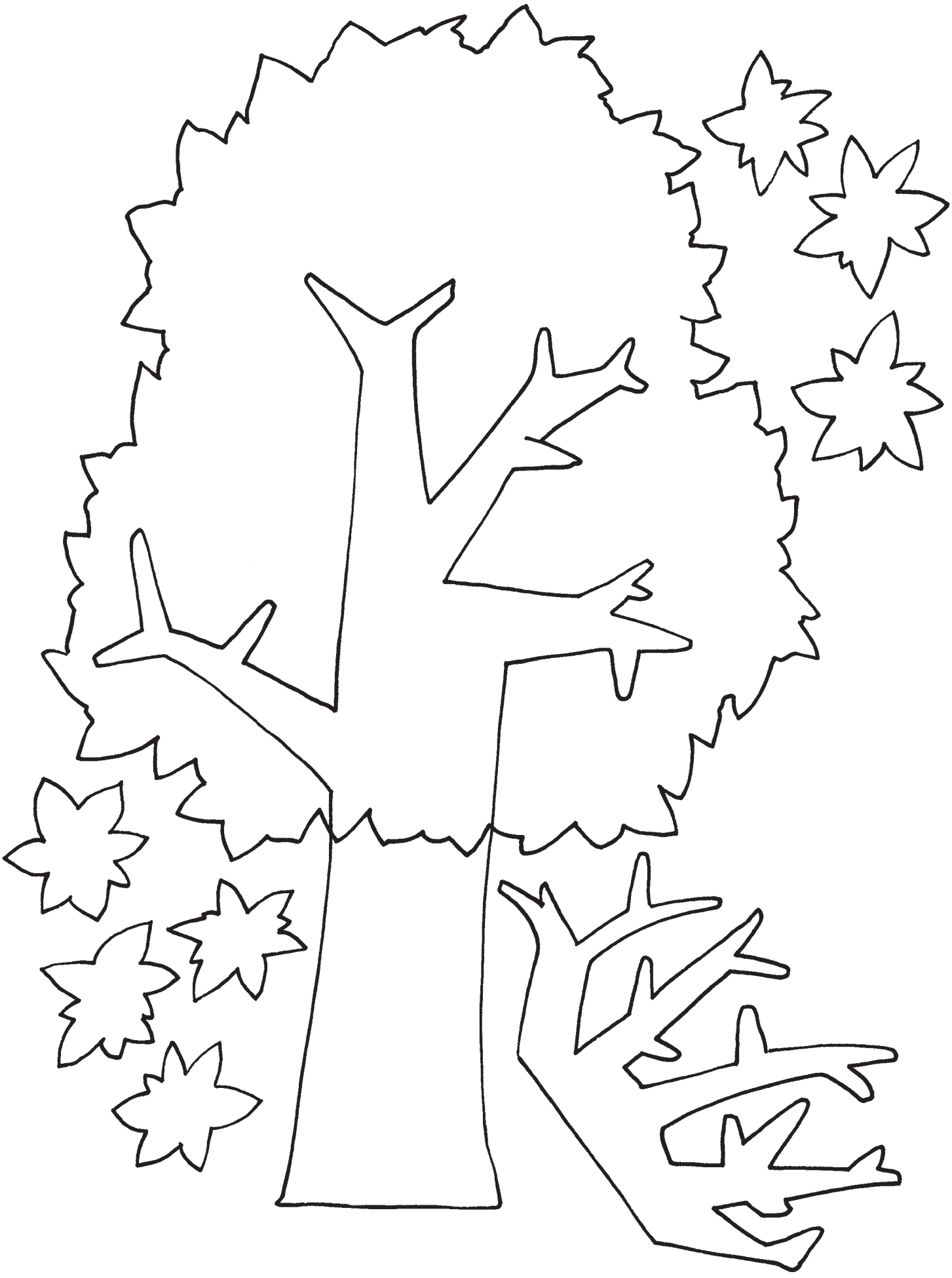
READING—Invite children to look through *See How the Turkey Grows* and find illustrations that show the different tree parts.

OUTSIDE—Provide children with thin paper and peeled crayons to create leaf rubbings of various different trees in the play area or outdoor classroom. Match these rubbings with photographs of the tree and the tree's bark.

FELT PUZZLE PARTS







HANG ON!

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Explore how roots help trees and soil
- Discuss one of the many benefits of trees
- Record predictions and results of an experiment

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~
LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem, leaves, flowers, seeds~~, roots)
LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., ~~absorption of water, absorption of light energy~~, support, ~~reproduction~~)
SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~
SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings ~~and maps, data tables, graphs (bar, pictograph)~~, writings

MATERIALS

- Tub of soil
- Large pitcher of water
- Chart paper
- Marker
- Science notebook pages
- Pencils

TEACHER PREPARATION

- Locate a place outside where children can observe tree roots and the experiment can be conducted
- Gather materials
- Make copies of science notebook pages (one per child)

QUESTIONS FOR DISCUSSION

- How do tree roots help the tree?
- What happens to the soil when there aren't any trees?
- What other ways are there to keep soil in one place?

PROCEDURE

1. Gather children under a tree with exposed roots above the ground. Talk about the roots: how they look and why they are showing above the ground.
2. Brainstorm with the children how tree roots help the tree. Record their ideas on the chart paper.
3. Distribute science notebook pages and pencils. Explain to the children that they are going to participate in an experiment to see how the roots help both the tree and the soil.

4. Place soil in large tub. Allow children to make soil into a pile in the center of the tub.
5. Ask for several volunteers to assist with the experiment. The volunteers are going to reach their hands down into the soil and grab a handful tightly in a fist. Their fists represent the roots of the tree and their arms are the trunks.
6. Explain to the children that the next step in the experiment is to pour water (like a heavy rain) onto the trees (arms), roots (hands) and soil. Ask children to write a hypothesis (or a guess based upon what they know about trees and roots) about what they think will happen when the tree experiences a heavy rain. Give children time to write or draw their hypotheses in their science notebook pages. Use the word *hypothesis* several times as you explain the experiment so the children know this is more than a guess.
7. Have each volunteer put a hand in the tub of soil, grabbing a handful of soil. Ask them to pretend their arms are trees and their hands are tree roots. Together they make up a forest of trees. A big storm is coming, and the trees have to hang on. Add water to the soil, pretending it is a heavy rainstorm.
8. What happened? Ask children to record the results of the experiment in their science notebook pages.
9. Share their hypotheses and results. Talk about what happened.

ASSESSMENT

Discussion	Contributed ideas about how roots help the tree during the brainstorming session	Participated during discussion but did not share any new ideas	Did not participate in discussion but listened attentively
Hypotheses and Results	Recorded hypothesis and results in science notebook pages as developmentally appropriate	Recorded either a hypothesis or the results in science notebook pages as developmentally appropriate	Hypothesis and/or results were shared orally but not recorded in science notebook pages
Final Discussion	Participated in final discussion stating 2 or more ways that the roots help the tree and/or soil	Participated in final discussion stating 1 way that the roots help the tree and/or soil	Listened but did not participate in the discussion

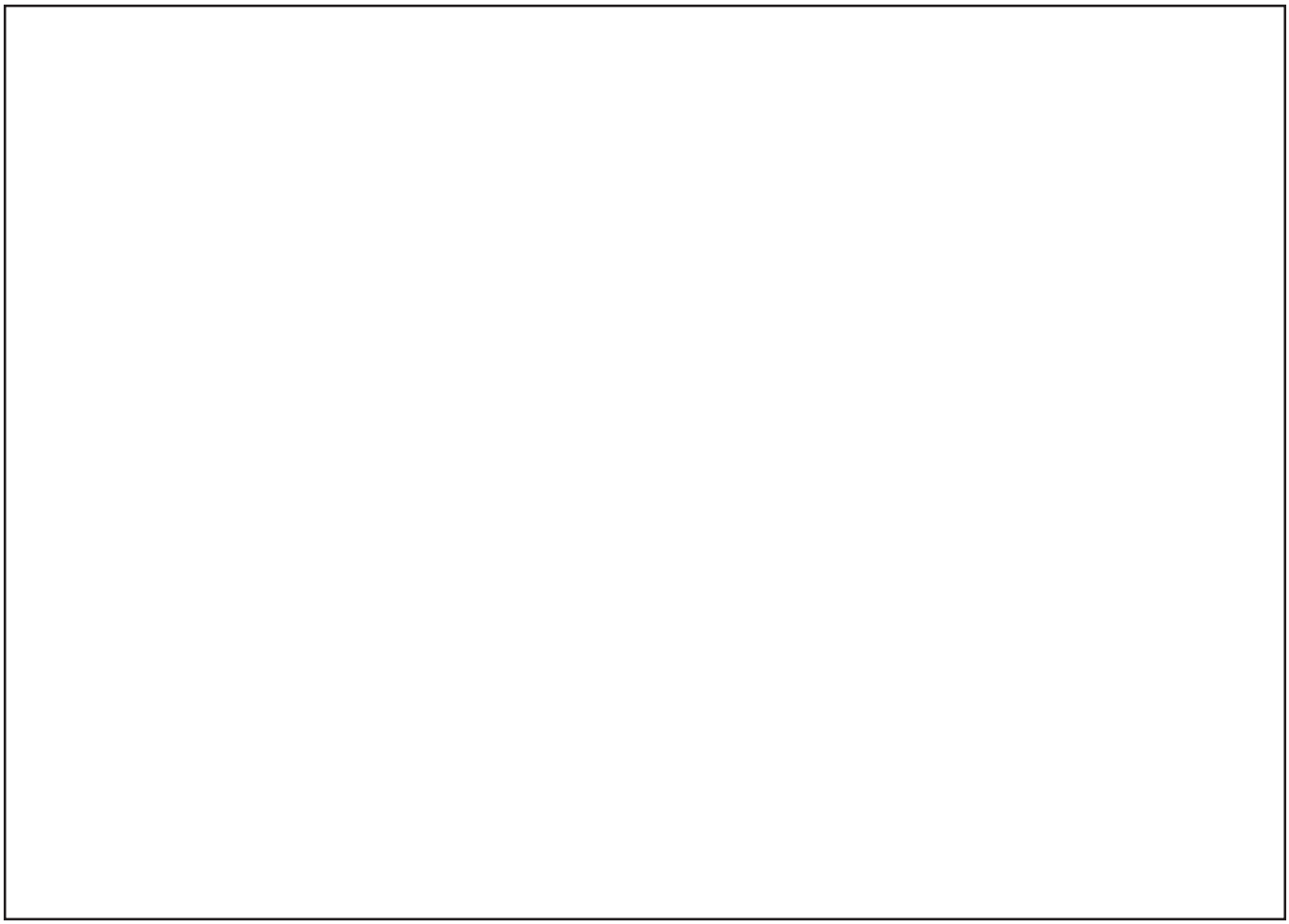
LEARNING CENTER ACTIVITIES

BULLETIN BOARD—Take photographs of the children as they are conducting the experiment. Provide the children with the various photographs. Ask them to put them in the order of the experiment and write captions so others will know what they are doing in the pictures and what they learned from the experiment. Challenge them to go beyond just describing what is happening in the picture to include details that they want others to know that cannot be ascertained from the picture.

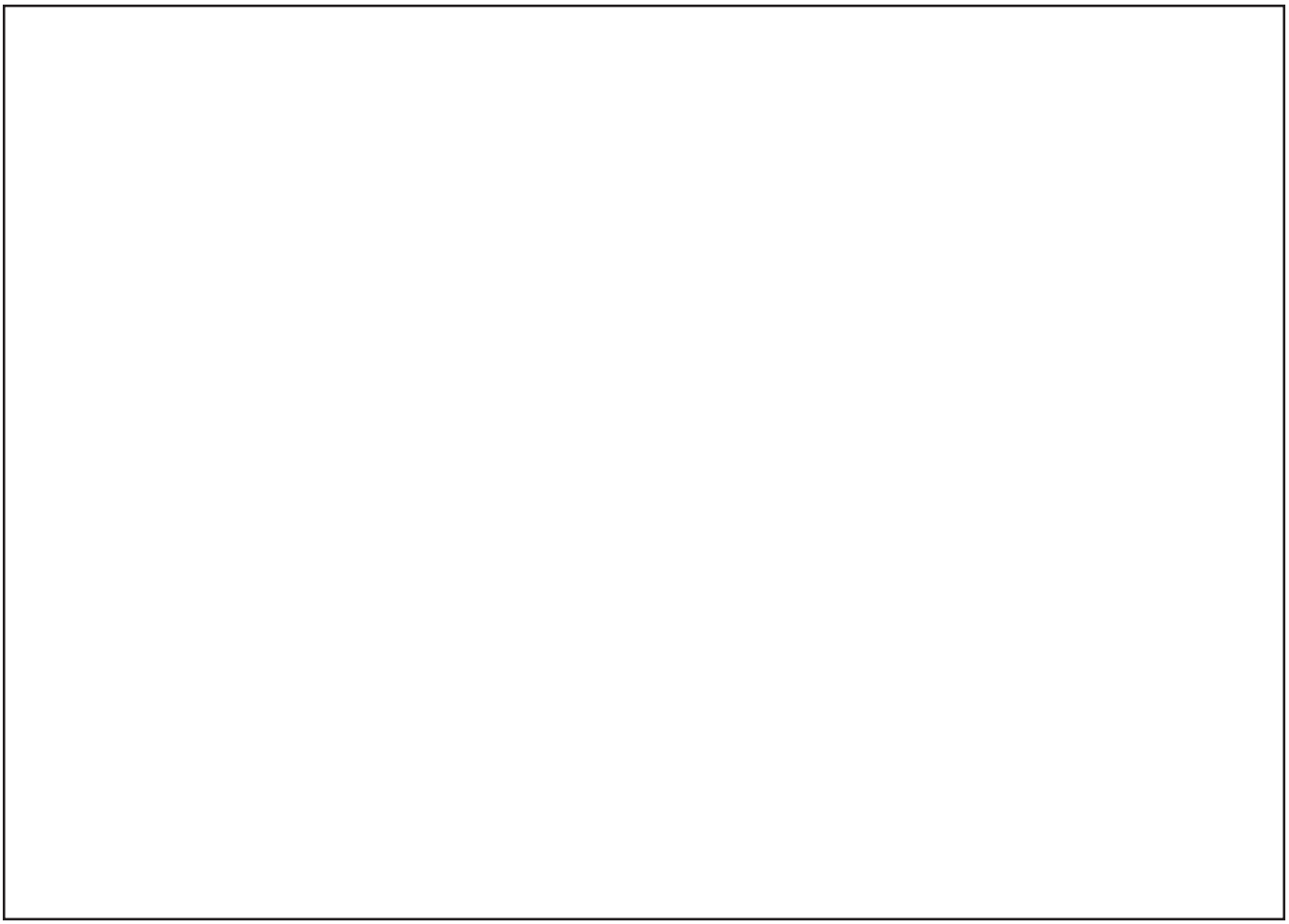
READING—Examine the trees depicted throughout *See How the Turkey Grows*. Look for exposed roots and discuss how they are assisting the tree.

FIELD TRIP—Visit a site where a bulldozer has pushed over trees or a creek bank and examine the exposed roots.

HANG ON!



Record your hypothesis.



Record the results of the experiment.

DO TREES GET DRINKS?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Conduct an experiment to simulate how water travels through plant structures to the leaves
- Fulfill responsibilities as a group member during an experiment
- Discuss the purpose of the stem of the plant
- Record and illustrate the results of the experiment in a science notebook

GLES ADDRESSED

LO.1.D.K.a Observe ~~and compare~~ the structures and behaviors of different kinds of plants ~~and animals~~
LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, ~~leaves, flowers~~, ~~seeds~~, roots)
LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, ~~absorption of light energy, support, reproduction~~)
LO.2.C.3.a Illustrate and trace the path of water and nutrients as they move through the transport system of a plant
SI.1.C.K, 1-2.a Use observation as support for reasonable explanations
SI.1.C.K, 1-2.b Use observations to describe relationships and patterns and to make predictions to be tested
SI.1.C.K, 1-2.c Compare explanations with prior knowledge
SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~
SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings ~~and maps~~, ~~data tables~~, graphs (bar, pictograph), writings

MATERIALS

- Chart paper and marker
- Plastic knives (1 per group of 3 children)
- Celery stalk (with leaves)—1 per group of 3 children
- 2 clear plastic glasses or jars per group of 3 children
- Water
- 2 colors of liquid food coloring (red and blue work best)
- Spoon—1 per group of 2 or 3 children
- Camera (optional)
- Red, blue and green colored pencils—1 of each color per child
- Experiment sheet—1 per group
- Trays or something to put the experiment on—1 per group
- Science notebook pages

TEACHER PREPARATION

- Determine how to divide the children into small groups of 2 or 3
- Copy experiment sheet
- Gather supplies and prepare a tray for each group to include a celery stalk, plastic knife, 2 clear plastic cups, a spoon, several paper towels and an experiment sheet
- Designate a central location for food coloring
- *Please note:* This experiment takes some time so it is best done during a morning session so children have the day to watch the water move up the celery.
- Make copies of science notebook pages (one per child)

PROCEDURE

1. Gather children and discuss the part of the plant between the leaves and the roots—the stem. Brainstorm their ideas about what the stem does for the plant. Record their ideas on the chart paper.
2. Explain to the children that they are going to conduct an experiment to see how the stem of the plant or trunk of the tree works. The celery stalk will represent the trunk of the tree with the bottom being the roots and the top leafy section being the branches and leaves.
3. Talk with children about the role of a scientist. They use clear, descriptive words to talk about experiments. Brainstorm a list of words that describe the celery. Discuss each as the children provide them, talking about whether or not the word really describes the celery. Post the list so children can see it as they work.
4. Place children in groups and distribute trays with materials for the experiment.
5. Ask children in group to assign each member one of the following responsibilities:
   Water preparer—fills cups with water, adds food coloring and mixes it into the water
   Celery preparer—cuts celery and places it into the cups
   Recorder—keeps track of what the group does on the experiment sheet
6. Once the children are in their groups then each member does the following:
   Water preparer—fill the two containers about three-quarters full with water and add enough food coloring (from the designated central location) to make a dark solution. Make one container of red water and one of blue. Use the spoon to stir. Place the two cups next to each other on the tray.
   Celery preparer—trim away the bottom third of the celery stalk and then place the celery stalk so it has the cut end in the water in each container of colored water.
   Recorder—completes the job portion of the experiment sheet.
7. Once the experiment is prepared, each group should talk about and make a prediction or guess about what they think will happen. The recorder should write and/or draw the group's prediction on the experiment sheet.
8. This experiment takes some time to work, so at this point it should be set aside and checked every 30 minutes until the end of the day and again the next morning. Each time, the children should record what the celery looks like using drawings and words.
9. At the end of the experiment, children make one last recording and then compare the results with their predictions. The teacher should draw everyone together and discuss what happened. The word *absorption* should be introduced and used throughout the discussion.
10. After completing the discussion, distribute the children's science notebook pages and ask that they represent the final results of the experiment in their notebooks, labeling the parts of the celery and indicating how the water was absorbed through the stem into the leaves.
11. Display the experiment, the groups' experiment sheets, and pictures of the experiment so children can further discuss their ideas and share them with visitors.

QUESTIONS FOR DISCUSSION

- What happened to your celery? Why?
- How are celery and trees alike?
- How are trees like other plants?
- How does the stem help the plant?

ASSESSMENT

Discussion	Contributed ideas about the purpose of the stem of a plant/tree	Participated during discussion but did not share any new ideas	Did not participate in discussion but listened attentively
Experiment	Fulfilled responsibilities during the experiment	Required adult intervention to fulfill responsibilities during the experiment	Did not participate in group work during the experiment
Final Discussion	Participated in final discussion adding ideas and theories about how the stem helps the tree/plant	Participated in final discussion but contributed no new ideas or theories	Listened but did not participate in the discussion
Science Notebook Drawing	Illustration shows details of celery including the path of the colored water	Illustration shows some details but has some inaccuracies	Illustration does not represent the experiment

LEARNING CENTER ACTIVITIES

NUTRITION—Provide children with a healthful drink (milk or 100 percent juice) and a straw. Suggest that they are going to be like the tree. The straw is the stem or trunk of the tree. They are the leaves, and the bottom of the cup or container is where the roots soak up the nutritious liquid. They should suck up their drink through the stems or trunks and consider how it is helping their bodies. This is how the tree sucks up moisture and nutrients that go to the leaves. The leaves, just like their bodies, convert that to energy to help the tree grow and develop. Talk about what happens when the cup or container is empty, there is more there than they can hold or the container is filled with something that isn't good for them. Relate this to what happens to the tree.

SCIENCE—Add a "control" to the above experiment by placing a trimmed stalk of celery (with leaves) in a dry jar. Notice the wilted leaves.

SCIENCE—Encourage children to soak tree leaves in water for an hour and discuss how the veins stick out. Compare them to the veins on the children's hands. Use leaves of different shapes to have different vein patterns.

SCIENCE—Obtain a round and/or a cut off branch from someone's wood pile. Explain how the tree grows a new ring of wood each year. Encourage children to age the tree by counting the rings. Compare center rings with outside rings.

DO TREES GET DRINKS EXPERIMENT RECORDING SHEET

Record each person's job in your group:

Celery Preparer _____

Water Preparer _____

Recorder _____

Draw your group's prediction.

Write your group's prediction.

_____

_____

_____

_____

_____

_____

_____

_____

_____

WHAT HAPPENED?

1st Observation	2nd Observation	3rd Observation	4th Observation

WHAT HAPPENED?

5th Observation	6th Observation	7th Observation	8th Observation

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

NATURE JAR

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Distinguish seeds from other plant parts
- Collect seeds
- Discuss how seeds help plants
- Sort seeds by method of dispersal
- Use a hand lens to assist in looking at seed parts
- Draw a seed
- Write about how a particular seed is dispersed

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem, leaves, flowers~~, seeds, ~~roots~~)

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets~~, ~~equal arm balances, thermometers~~)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

MATERIALS

- Large piece of newsprint or white fabric
- Chart paper and marker
- Large, clear jar
- Collection containers
- Science notebook pages
- Pencils
- Hand lenses (1 per child)

TEACHER PREPARATION

- Scout seed collection area
- Gather materials
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside and challenge them to move through the area gathering as many different kinds of seeds as they can find. Emphasize that none of these are for eating and should not be put into mouths.
2. As children collect the seeds, ask them to empty their containers into the clear, collecting jar.
3. When children finish collecting the seeds, dump them out of the jar onto a large piece of newsprint or fabric.
4. Look through the collection and talk with children about how they knew what to gather.
5. Make a list of characteristics they looked for that told them which items were seeds.
6. Ask children to think about how the seeds are dispersed or how they travel (hitchhike on animal fur, wind or air born, float, explode, eaten, etc.).
7. Divide chart paper into columns and label each with one way seeds scatter. Challenge children to divide their collected seeds on the chart paper according to the way the plant scatters them.

8. While they are working, talk about why plants have seeds. Ask for their ideas about how the seeds help the plant to survive.
9. Once they have sorted the seeds, distribute the science notebook pages. Ask children to find a seed that they would like to study further. They should use the hand lens to look at it closely then sketch it in their science notebook pages then write about how they think the seed is dispersed and the reasons for their thinking.

QUESTIONS FOR DISCUSSION

- How do you know when something is a seed?
- Why do plants make seeds?
- When do plants make seeds? How do they know to make them?
- How do seeds travel? How are they dispersed or scattered?
- What are some seeds that animals eat?

ASSESSMENT

Seed Collection	Collected only seeds	Collected seeds as well as a few other natural objects	Collected no seeds
Discussion	Contributed ideas about the purpose of the seed	Participated during discussion but did not share any new ideas	Did not participate in discussion but listened attentively
Seed Sorting	Assisted with seed sorting, accurately identifying the dispersal method for at 3 or more seeds	Assisted with seed sorting, accurately identifying the dispersal method for 1 or 2 seeds	Assisted with seed sorting but did not accurately identify any dispersal methods
Hand Lens Use	Hand lens was used to assist in examining the seed	Hand lens was used but not effectively	Hand lens was not used
Science Notebook Drawing and Writing	Drawing represented seed with accurate dispersal method identified	Drawing represented seed but dispersal method inaccurately identified	Drawing does not represent seed or dispersal not identified

LEARNING CENTER ACTIVITIES

ART—Provide materials for children to make seed collages.

READING—Read *See How the Turkey Grows* and study the pictures and story for evidence of seeds and how they relate to turkeys.

SCIENCE—Display the nature jar in the classroom and let the children dump it out and match the seeds. Add a balance scale to the area so children can explore and contrast weights of the various seeds.

SCIENCE—Take pictures of the various seeds plants in the area where the children collect the seeds. Challenge them to match actual seeds with the plant that produced them.

SCIENCE—Put out raw pumpkin or squash seeds that have been soaked in water. Encourage children to open them to see the little plant inside. Point out the stored food for the plant. Be sure to provide hand lenses and science notebook pages for children to record their observations.

SCIENCE—Provide soil, pots and water for children to plant some of the seeds they collected. Record the process and growth with photographs and/or drawings.

GROUP—Play "what's missing" with several of the different kinds of seeds.

HOME AND SCHOOL CONNECTION—Encourage children to search their yards and play areas at home for seeds to bring in a share with the rest of the class.

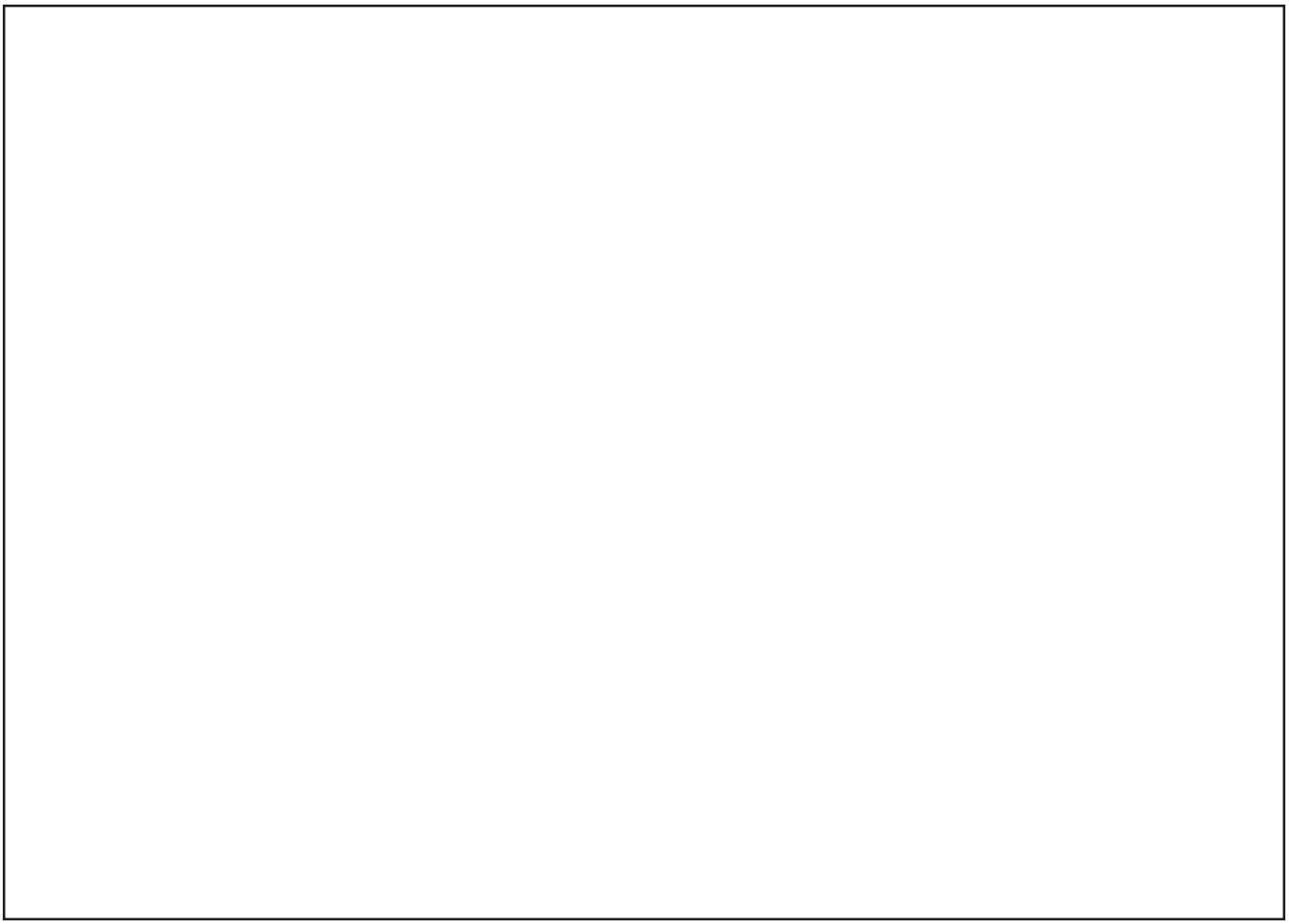
MUSIC—Bring in milkweed pods for the children to explore. Teach them the following song to the tune of *I'm A Little Teapot*.

I'm a little milkweed cradle you see.	*(cup hands together)*.
I have baby seeds in me.	*(peek inside)*.
Open me up and hold me high.	*(open hands and hold high)*.
Blow, blow wind and my seeds fly.	*(blow on hands and wiggle fingers)*.

NUTRITION—Plan a Seed of the Day snack, serving a different type of seed each day (sunflower seeds, pumpkin seeds, peanuts, popcorn, etc.).

OUTSIDE—Challenge children to be one large dandelion seed. Encourage them to curl up together on the ground. Then the sun warms them, and they begin to grow a lovely dandelion. At this point all should stand close to one another, hold the arms up into the sky and wiggle their fingers. Then they are dandelion seeds, and the wind blows them all over the play yard. They should disperse at this point to grow a new dandelion.

SEED DRAWINGS



Draw your seed.

How is your seed dispersed?

PLANT AND ANIMAL PRODUCT PUZZLES

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Match plants and animals with the products people harvest from them

GLES ADDRESSED

EC.1.A.1.a Identify ways man depends on plants and animals for food, clothing, and shelter

MATERIALS

- A set of the plant and animal product puzzles, colored, laminated and cut apart

TEACHER PREPARATION

- Prepare plant and animal product puzzles

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Place the plant and animal product puzzles on a table where children can manipulate them during center time.
2. Allow children to work with the puzzles, asking questions when appropriate.

QUESTIONS FOR DISCUSSION

- What do you think people make from this plant or animal?
- What are other ways people use plants and animals?

ASSESSMENT

Plant and Animal Product Matching	Accurately matched 6–8 of the plants and animals with the products people harvest	Accurately matched 4–5 of the plants and animals with the products people harvest	Accurately matched 2–3 of the plants and animals with the products people harvest

LEARNING CENTER ACTIVITIES

ART—Provide various types of yarn and glue for making collages and discuss how some yarn is made from sheep's wool.

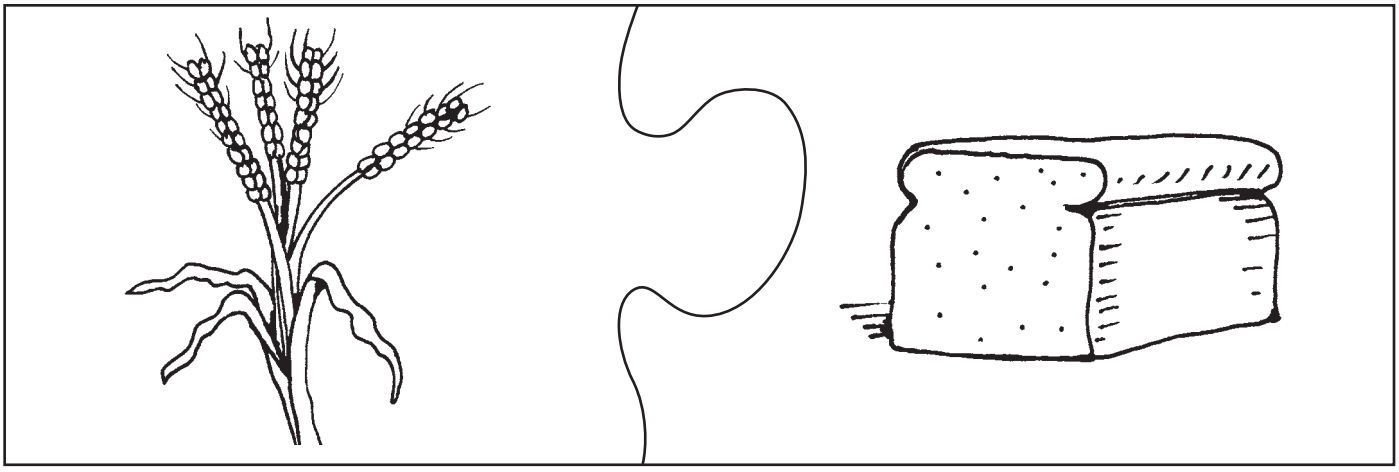
SCIENCE—Create a display of wool, feathers, honeycomb, wood and leather articles for children to explore. Be sure to provide magnifying glasses and balance scales for children to explore materials.

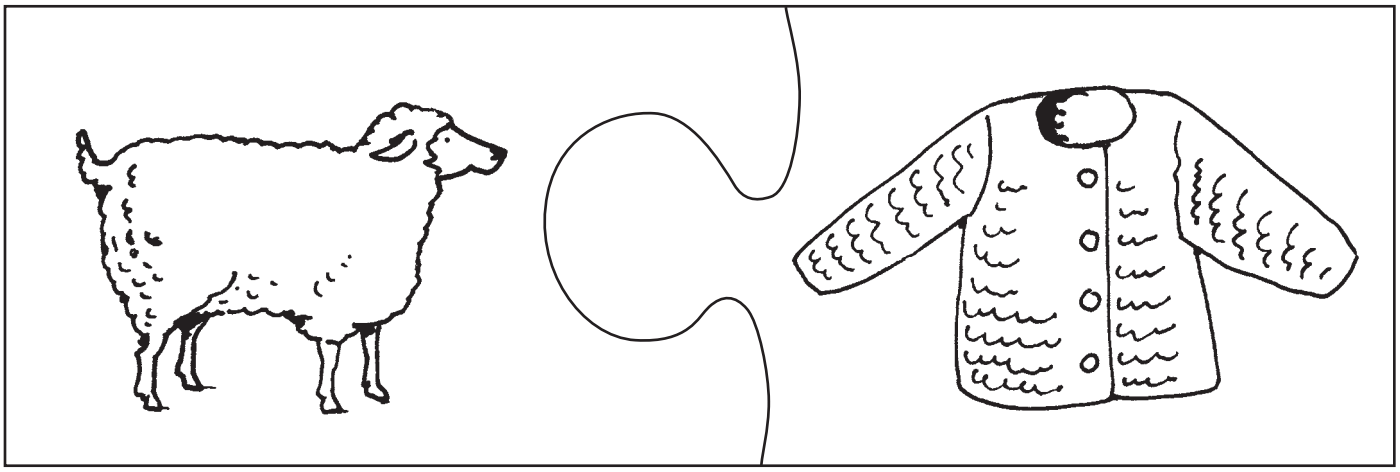
SCIENCE—Challenge children to search the classroom for as many plant and animal products they can find. Ask them to create a list by drawing or writing the name of the item and whether it is a plant or animal product. Graph the results.

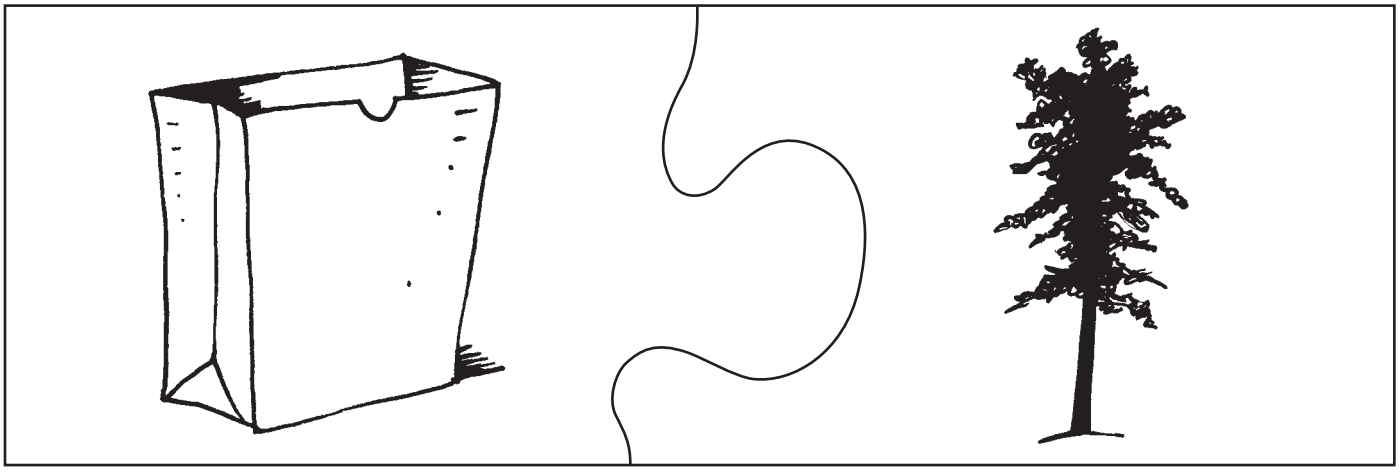
HOME AND SCHOOL CONNECTION—Send home recording sheets with the children and ask them to search their homes for plant and animal products they use in everyday life. Talk about each child's discoveries as they return the recording sheets to school.

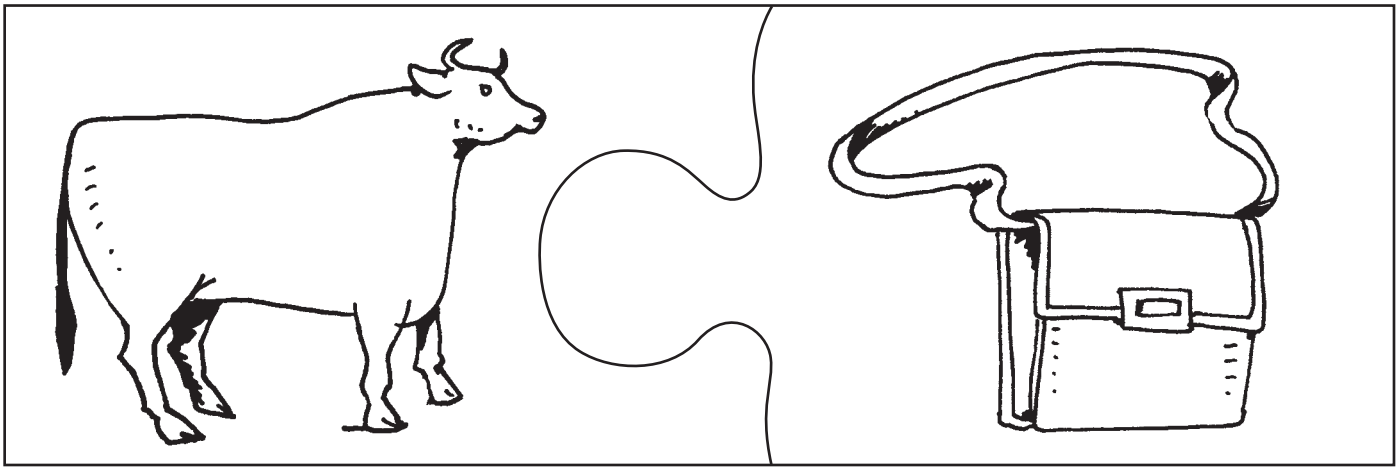
NUTRITION—During meals and snack times, discuss where the food was grown and harvested.

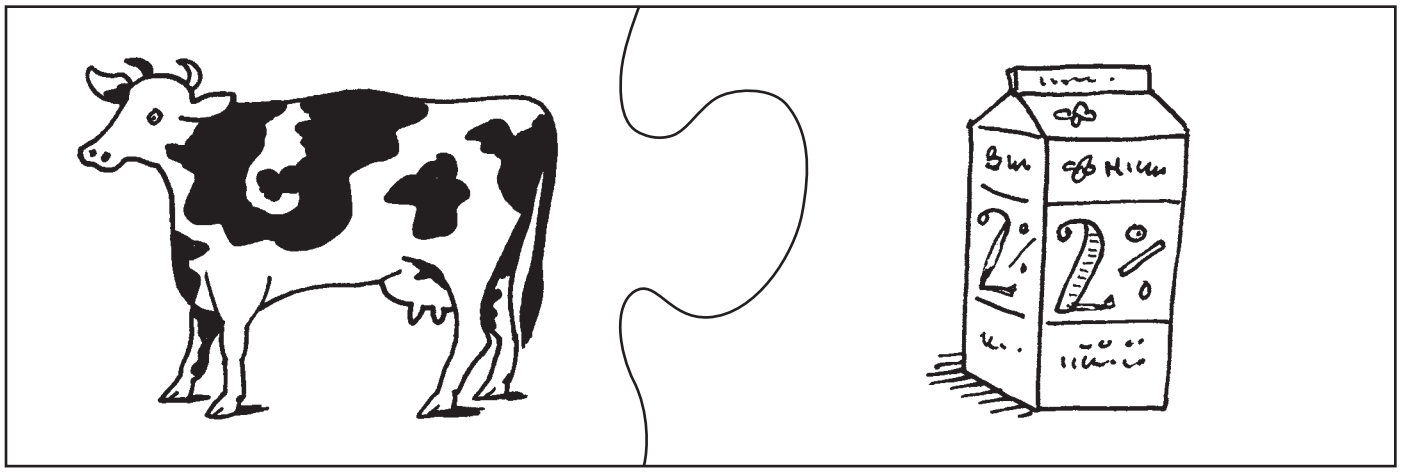
GROUP—Create cards with farm animals on them. There should be 2 of each card (cows, ducks, chickens, pigs, sheep, rabbits, turkeys). Tie yarn around the cards to create necklaces. Bring in actual products or empty boxes from products harvested from these farm animals. Challenge children to hang their cards around their necks so no one else can see the cards. They should find their partner by making the sound that the animal makes. With their partner, they should select the product that was harvested from their animal. When everyone has been matched up and products selected, groups of children should show their product and have the rest of the class guess their animal. If class is unsuccessful, children can make their animal's sound.

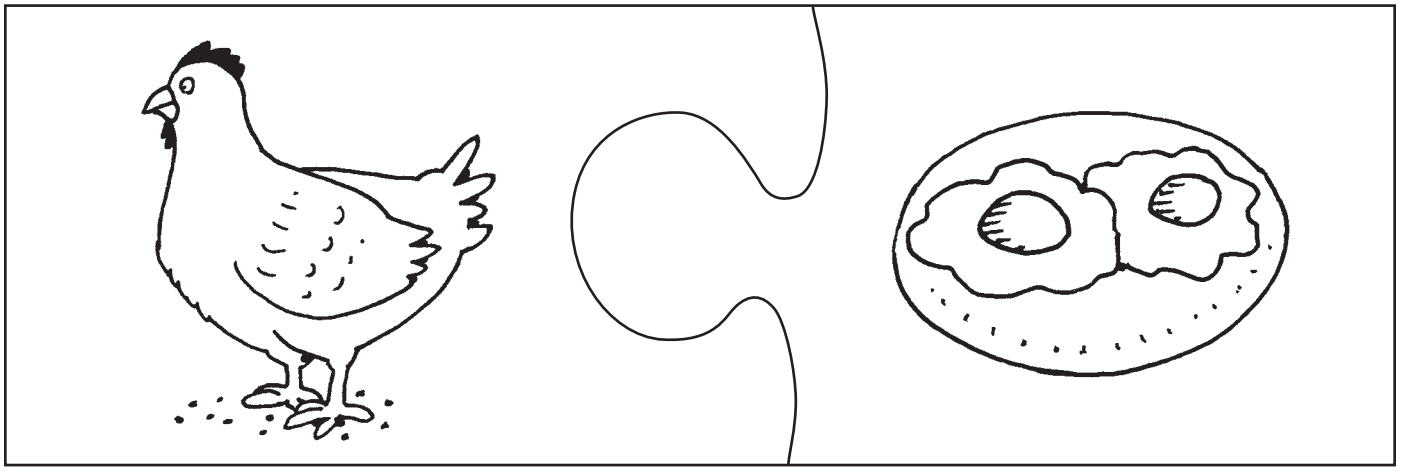


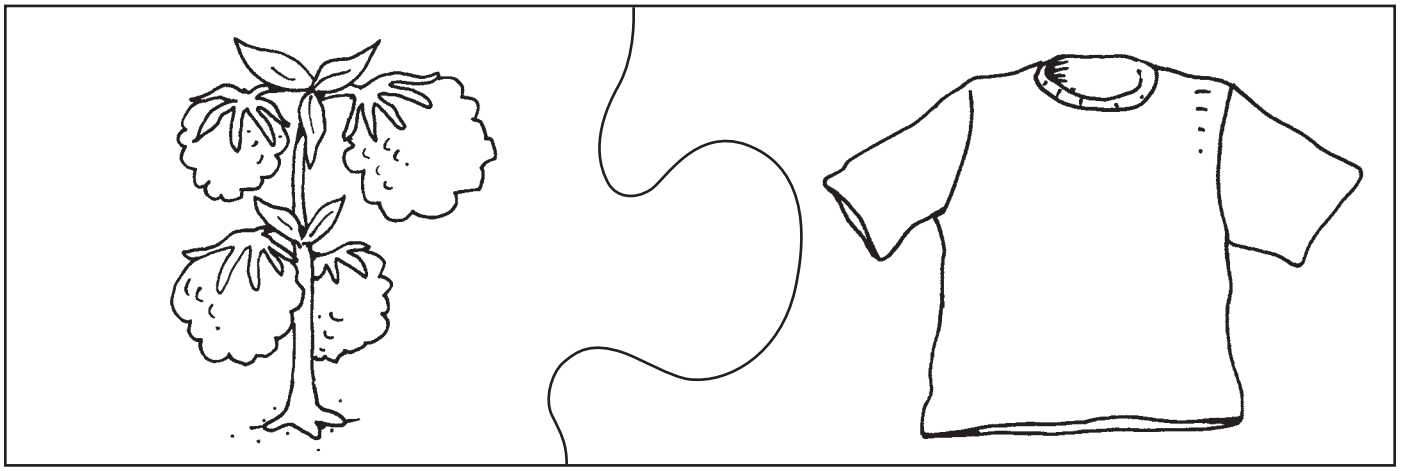


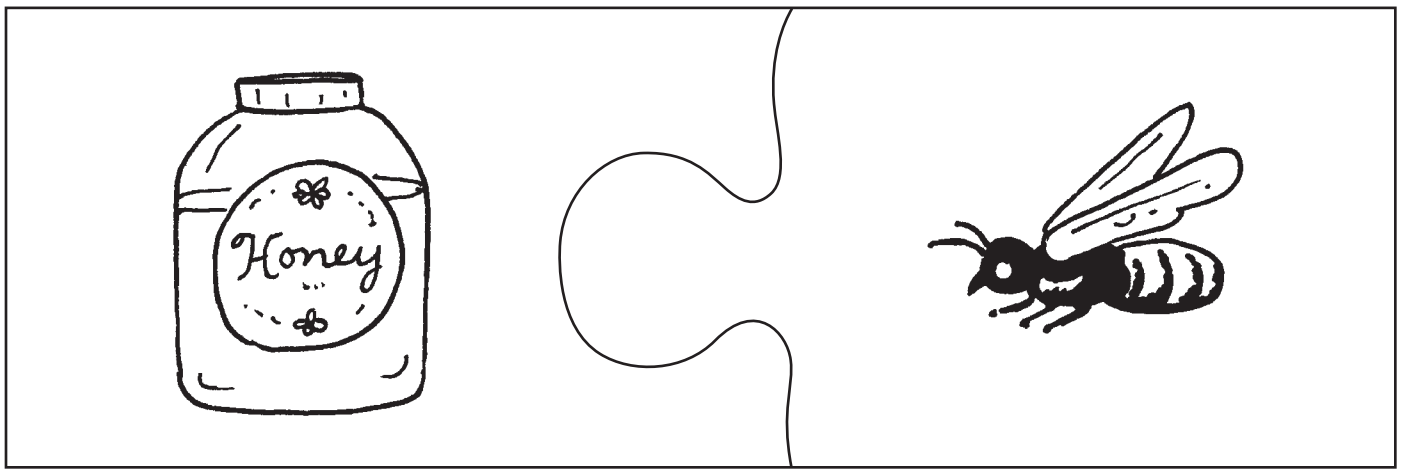











Honey

WHAT HAPPENS IN THE FALL?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify characteristics of fall
- Draw pictures of people and animals in the fall

GLES ADDRESSED

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, fall, ~~winter, spring~~)
EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals
EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities, food)

MATERIALS

- Science notebook pages
- Colored pencils or crayons
- Pencils
- 3 pieces of chart paper
- Marker

TEACHER PREPARATION

- Gather materials
- Label one piece of chart paper—"Characteristics of fall"
- Label a second piece of chart paper—"Things people do in the fall"
- Label the third piece of chart paper—"Things animals do in the fall"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside on a typical fall day. Ask them what time of year it is. Someone is sure to say "fall." Ask how they know it is fall.
2. Read through *See How the Turkey Grows* with the children and talk about which pages depict fall. Ask them to consider how the author and artist indicated it was fall.
3. On the chart paper, record their ideas about how they know it is fall. Provide more guidance by asking how fall is different than the rest of the year. Ask about how the environment changes. Prompt with questions about the weather, plants, precipitation, etc.
4. Once children have provided a number of characteristics of fall, flip to the second piece of chart paper labeled "Things people do in the fall." Ask children to list things they do in the fall that they cannot do other times of the year. List their ideas. Expand their responses with questions about how they dress and what they eat.
5. Finally flip to the last piece of chart paper and ask the children what animals do in the fall that they don't do during other times of the year. Prompt them with questions about how they look, eat, travel and where they live.
6. Once children have made many suggestions that distinguish fall for people and animals, distribute science notebook pages. Challenge children to draw a self portrait of themselves doing something in the fall. Talk about what they might include in the drawing that would help the viewer know it was fall. On the second

page, they should draw a portrait of an animal in the fall, again being careful to include an animal they might see in Missouri during the fall as well as elements in the picture that suggests fall to the viewer.
7. Allow children to spread out throughout the outdoor space to draw themselves and an animal in fall.
8. When finished, gather children back together and suggest that they share their illustrations. Collect them and bind them together to create a class book entitled *What Happens in the Fall?*

QUESTIONS FOR DISCUSSION

- How do you know when it is fall?
- How is fall different than other seasons of the year?
- How do plants look in the fall? Why?
- What is the weather like in the fall?
- What do people do in the fall that they can't do other times of the year?
- What do people wear? Eat? Play?
- What do animals do in the fall that they don't do other times of the year?
- How do they look? Travel? Eat?
- Where do animals live in the fall?

ASSESSMENT

Discussion	Participated during initial discussion and contributed 4 or more characteristics of fall	Participated during initial discussion and contributed 2–3 characteristics of fall	Participated during initial discussion and contributed at least 1 characteristic of fall
Fall Self-portrait Science Notebook Drawing	Self-portrait clearly indicated fall through clothing, activity and background as developmentally appropriate	Self-portrait indicated fall through clothing, activity or background as developmentally appropriate	Self-portrait hinted at fall through clothing, activity or background as developmentally appropriate
Fall Animal Science Notebook Drawing	Animal drawing clearly indicated fall through animal depicted, resemblance to animal in fall, activity and background as developmentally appropriate	Animal drawing indicated fall through animal depicted, resemblance to animal in fall, activity or background as developmentally appropriate	Animal drawing vaguely hinted at fall through animal depicted, resemblance to animal in fall, activity or background as developmentally appropriate

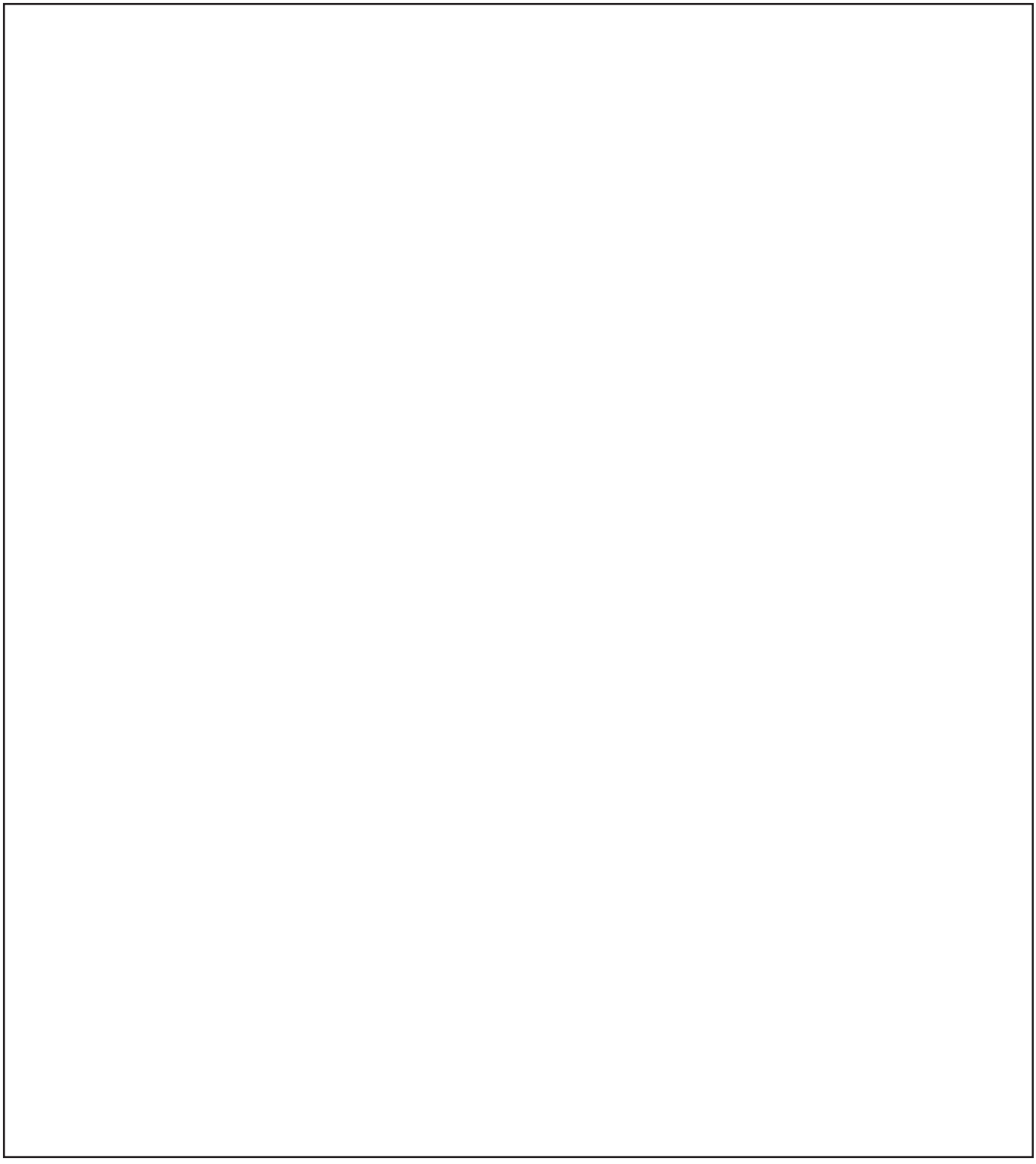
LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Sort animal and plant cards by those they might see in the fall and those they would not.

WHAT HAPPENS IN THE FALL?

Fall Self-Portrait

WHAT HAPPENS IN THE FALL?



Fall Animal Portrait

TURKEY PRINTS

CHILDREN COMPLETING THIS LEARNING EXPERIENCE WILL

- Examine turkey feet from a hen (female), gobbler or tom (mature male) and jake (immature male)
- Draw turkey feet
- Write about how the turkey's feet assist it in the habitat where it lives

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs, beaks~~, appendages, ~~body covering~~)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)

MATERIALS

- Feet from a gobbler or tom, jake and hen turkey *(These should be legally obtained. Missouri turkey season takes place in October and April. An enthusiastic hunter should be easy to find for this project.)*
- Hand lenses
- Play dough or clay
- Science notebook pages
- Pencils

TEACHER PREPARATION

- Dry the turkey feet in an upright position with the toes spread. This is most easily accomplished if the feet are put in position shortly after they are taken from the turkey. The feet don't need to be treated with anything. Drying generally takes several weeks depending on the humidity.
- Adult male turkeys are called gobblers or toms and have spurs on the back of their legs. Spurs are used when fighting other turkeys. Immature males are called jakes. Jakes have knobs on the back of their legs that will develop into spurs. Female turkeys are called hens, and they have no spurs.
- Make copies of science notebook pages (one per child)

PROCEDURE

1. Place dry turkey feet in the science center, along with hand lenses and play dough, for children to examine and experiment with making tracks in the play dough.
2. As the children are using the feet (during center time), discuss the similarities and differences in the feet. Introduce terminology as the children handle the various feet.
3. In their science notebook pages ask children to draw each of the 3 feet. Challenge them to write about how the turkey's feet help it in its habitat (strong claws for roosting in trees and digging up acorns, spurs for fighting other turkeys, etc.).

QUESTIONS FOR DISCUSSION

- What do you think the gobbler uses the spurs for?
- How do the turkey's feet help it in its habitat?
- Where do you think you might find turkey tracks?

ASSESSMENT

Science Notebook Drawing	Recorded using developmentally appropriate drawing all 3 of the turkey feet	Recorded using developmentally appropriate drawing 1 or 2 of the turkey feet	Drawing did not resemble turkey feet
Science Notebook Writing	Wrote as developmentally appropriate a logical way turkey's feet help it survive	Wrote as developmentally appropriate an idea of how the turkey's feet help it survive	Did not write about how the turkey's feet help it survive

LEARNING CENTER ACTIVITIES

ART—Place turkey feet near stamp pads or prepared paint pad (tray with paper towel folded in the bottom and paint poured over the paper towel, like a stamp pad). Encourage children to use the turkey feet to make turkey tracks. Paint turkey tracks on paper or shirts.

SCIENCE—Dry feet from other game birds (easily obtained with a hunter's cooperation), such as Canada geese, quail, ducks, etc. Examine and compare and contrast the different feet. Discuss how each bird's feet help it in its habitat.

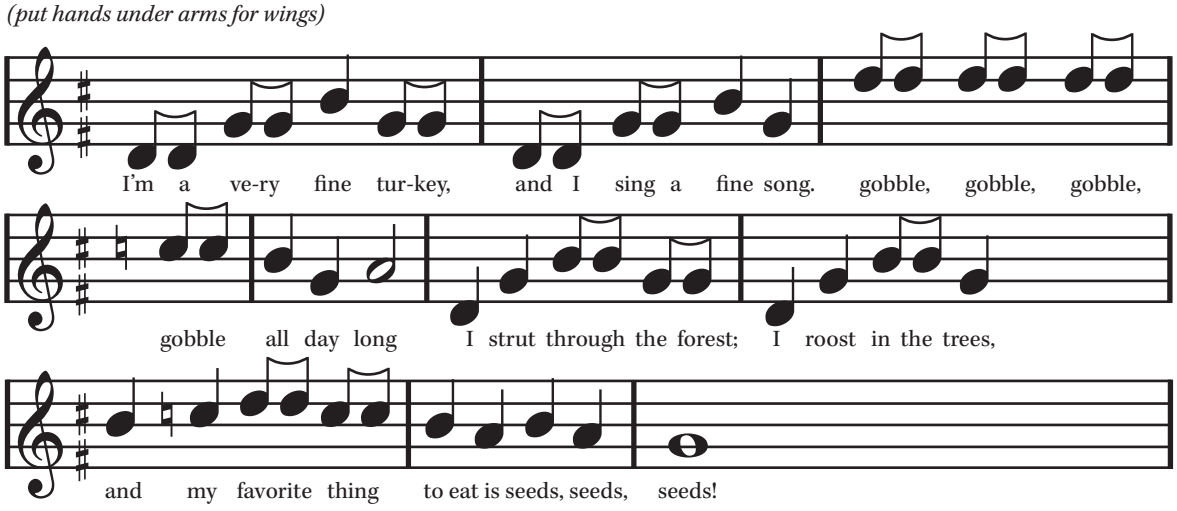
SCIENCE—Bring in domestic turkey feathers and wild turkey feathers. Challenge children to compare them and match them with pictures of the animals. Be sure to provide hand lenses for children to use to more closely explore the feathers.

READING—Encourage children to read *See How the Turkey Grows* and compare the turkey feet in the classroom to those depicted in the story. Look for ways the turkeys' feet help them survive throughout the story.

FIELD TRIP—Visit a turkey farm to view domestic turkeys. Discuss differences between wild and domestic turkeys. Discuss how turkeys in the grocery store look compared to live ones.

GROUP—Invite a hunter to come into the classroom and reproduce turkey calls, or even bring in a wild turkey he has harvested.

MUSIC—Teach the children the following song:



OUTSIDE—Teach children to play "Catch a turkey." Several children are hunters; the rest are wild turkeys. The hunters are sleepy so they take a nap (hide their eyes while the turkeys hide). When they wake up, they're hungry and want some wild turkey for supper. They have to go hunting. As they tag the turkeys, they go and sit where the hunters were sleeping. To help the hunters find the turkeys, the turkeys can gobble softly.

TURKEY PRINTS

Hen	Jake	Tom or Gobbler

How do the turkey's feet help it survive?

A FOXY LIFE STORY

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify and sequence life events in their own lives
- Illustrate the sequence of the life cycle of a fox

GLES ADDRESSED

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., ~~butterfly, frog, chicken, snake~~, dog)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., ~~butterfly~~, dog, ~~frog, chicken, snake~~)

MATERIALS

- 3 pieces of chart paper
- Marker
- Fox life cycle cards
- Fox animal card
- Blank accordion books
- Colored pencils
- Crayons
- Markers
- Photographs or magazine pictures of significant events in a human life—pregnancy, birth, going to school, graduations, marriage, children and family, retirement and old age

TEACHER PREPARATION

- Gather materials
- Gather photographs or magazine pictures to illustrate the human life cycle
- Make a blank accordion book for each child. Use heavyweight paper cut in a long, narrow strip. Fold it in half. Fold each end back to the fold. The book will have 4 pages on each side.

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children for a group discussion. Explain to the children that a life cycle is a series of changes that every living thing goes through. For animals, it begins the minute a baby begins growing in an egg and continues until death. Not every creature has the same life cycle, but all follow a predictable pattern.
2. Explain to the children that even people have life cycles. So far in their life cycles the children have experienced significant changes. Ask the children to consider what they can do now that they couldn't do when they were just born. Record their ideas on a piece of chart paper.
3. Go through their list again and brainstorm how the children think they learned to do all of these things. Write their ideas on the chart paper next to the significant changes.
4. On a new piece of chart paper work with the children to put their significant changes into chronological order or in a timeline format. Talk with them about how they changed over time and changes at each point contributed to later changes.
5. Share the pictures of the human life cycle with the children. Challenge them to assist in putting them in a sequential order.

6. Go through the fox life cycle cards. Talk with the children about the order of these cards. Explain to the children that just as people go through a life cycle so do foxes.
7. Share the accordion books with the children. Explain that they get to illustrate the life cycle of a fox.
8. On another piece of chart paper, brainstorm with them key events in the life cycle of a fox. This might include the mother fox just before she has her kits, kits together when they are young, a young fox out on her own, an old fox. etc.
9. Once the children have a list of significant events, put them in sequential order with the children. Talk about how each might be illustrated. For example: How does the mother fox look just before she has her kits? Where does she have her kits to keep them safe? What do the kits do when they are all together with their mother? How many of them are there? How does an old fox look? Display this list for the children to refer to as they work.
10. The accordion books might be drawn on both sides which would provide 8 surfaces for illustration, or the children might just use one side with 4 illustrations. Encourage the children to select either 4 or 8 events in the life of the fox that best illustrates what they know about the life cycle. The books will tell the story of the fox without words. They must think of the best way to show how the fox lives throughout its life.
11. Allow children to work on their accordion books over several days, adding detail that draws the viewer into the book.
12. Display the books by pulling out the accordions and standing the books up.

QUESTIONS FOR DISCUSSION

- What are some significant events in your life?
- How have you changed since you were a baby?
- What do foxes need to survive?
- Where do foxes live?
- How can you make your fox illustration look old? Young?

ASSESSMENT

Discussion of Human Life Cycle	Actively contributed to discussion, pointing out changes they have gone through since birth.	Attentively listened to the discussion but did not contribute
Accordion Books	Illustrations accurately depicted a fox at various points in the life cycle in sequential order	Illustrations accurately depicted a fox at various point in the life cycle but not in sequential order

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Place pictures of human life cycle out for children to place in sequential order.

HOME AND SCHOOL CONNECTION—Work with children to develop interview guidelines to interview grandparents or older friends about key points in the life cycle for them.

ANIMAL WRAPPERS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Compare different types of animal coverings
- Sort animal pictures by coverings
- Identify ways that animal coverings assist the animal in surviving

GLES ADDRESSED

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs~~, ~~beaks, appendages~~, body covering) (Do NOT assess terms: sensory organs, appendages)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of plants and animals

MATERIALS

- Several examples of animal coverings (scales or something smooth like scales, feathers, wool or fur)
- Cups of water
- Eye droppers
- Hand lenses
- Animal cards
- 3 labeled boxes or sorting trays
- 3 pieces of chart paper
- Marker

TEACHER PREPARATION

- Set up a learning center for the children to examine and experiment with the various types of animal coverings. Place the water and eye droppers, hand lenses and examples of animal coverings in this center.
- Label the boxes or trays with pictures and words—"Feathers," "Fur," "Scales." Place the boxes and animal cards in a second learning center.
- Label the three pieces of chart paper—"Feathers," "Fur," "Scales." Under the title of each chart paper, draw the following table (substituting feathers and fur for scales as appropriate):

Scale Discoveries	
Animals with Scales	
Ways Scales Help These Animals Survive	

PROCEDURE

1. Set up learning centers and introduce them to the children. In the first learning center, encourage the children to examine the animal coverings closely. Water repellency can be explored by dropping water onto the coverings using the eye droppers. In the second learning center, challenge children to sort the animal cards by the type of skin the animal has.
2. Once all of the children have visited the centers, bring them together to discuss their findings. Bring out each type of covering and ask the children to share things they observed about this particular covering. Record their ideas on the appropriate chart paper. Then talk about which animals they found had this type of covering. Again, record their ideas on the chart paper.

QUESTIONS FOR DISCUSSION

- What did you notice about this animal covering?
- What animal do you think has this type of covering?
- How is this covering like your skin?
- How does this covering help the animal survive?
- Why do you think these animals have this kind of covering?
- How are these animal coverings alike? Different?

ASSESSMENT

Center Work Observation	Appropriately worked with hand lenses and other materials to gather information about the various types of animal coverings	Worked with hand lenses and other materials to gather information about the various types of animal coverings with redirection	Did not use materials appropriately to examine animal coverings
Center Work Sorting Animal Cards by Covering	Accurately sorted all of the animal cards by covering	Accurately sorted most of the animal cards by covering	Accurately sorted a few of the animal cards by covering
Final Discussion	Participated during discussion and contributed 3 or more ways animal coverings might help the animals survive	Participated during discussion and contributed 2 ways animal coverings might help the animals survive	Participated during discussion and contributed 1 way an animal covering might help the animal survive

WINTER

WINTER TREE PORTRAITS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Discuss characteristics of winter
- Explore trees in winter
- Identify some of the ways trees change from fall to winter
- Create a winter tree drawing
- Record winter tree facts

GLES ADDRESSED

LO.1.A.3.a Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature)
EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~
UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

MATERIALS

- Winter day
- Outdoor area with trees (the same as used for summer and fall tree portraits)
- Pictures of animals that live in trees (squirrel, raccoon, bird, etc.)
- Chart paper
- Markers
- Cardstock
- Oil pastels

TEACHER PREPARATION

- Select an outdoor area and a place where children may work
- Gather supplies

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together outside in the sunshine.
2. Ask how they know it is winter. Record their ideas on the chart paper.
3. Brainstorm a list of seasonal changes that have occurred in the outdoor space.
4. Encourage children to think about what trees and other plants need to survive. Discuss the availability of these elements during the winter. Talk with them about how plants cope with the cold and snow.
5. Remind the children of their summer and fall tree portraits. Ask how the trees have changed. Talk about the tree parts that are still there (roots, stem or trunk and branches). Some even may still have their leaves (oak trees often retain their leaves through the winter) and seeds.
6. Remind children of when they pretended to be a tree in the summer and the fall. Tell them that they are going to repeat that experience, but now it is winter. They can't take off their shoes because they need to protect their roots from the cold. Their roots are under the ground, helping hold the tree straight and tall. Feel their roots holding on to the cold soil. Think about moving up through their trunk or stem. They should lift their branches (arms) high into the sky, swaying as the wind rustles through them. Their branches are exposed to the snow and wind. Perhaps their tree hangs on to its leaves until spring, but the leaves are now

brown and crispy, rustling in the wind. Maybe they are a tree that the turkeys have decided to roost in. They should think about how that weight feels on their branches. Close their eyes and be a tree in winter! How does it feel?

7. Encourage children to return to the tree they drew in the fall. This time, instead of watercolors, ask that they draw the tree using oil pastels, making sure to include all of the parts of the tree they observe. Other environmental phenomena that are in the immediate environment may be added to the picture depicting things the tree needs to survive, animals and people using the tree or plants around the tree during the winter.
8. When they are finished with their tree portraits, ask them to turn it over and write 3 facts about trees in winter.
9. Display and then save their drawings to have a complete seasonal set in the spring.

QUESTIONS FOR DISCUSSION

- How do you know it is winter?
- What has changed in our outdoor environment?
- How do the trees look different? The same?

ASSESSMENT

Discussion	Participated during initial discussion and stated 3–4 seasonal changes associated with winter	Participated during discussion and stated 1–2 seasonal changes associated with winter	Did not participate in discussion but listened attentively
Tree Drawing	Drawing of tree included roots, tree trunk and branches depicted in winter as developmentally appropriate	Drawing of tree included some but not all parts of the tree depicted in winter as developmentally appropriate	Drawing of tree did not resemble tree or was not depicted in winter
Writing	Wrote 2 or more accurate facts about trees in winter as developmentally appropriate	Wrote 1 accurate fact about trees in winter as developmentally appropriate	Wrote about trees but inaccurate information

LEARNING CENTER ACTIVITIES

ART—Provide various collage materials (construction paper, cotton balls, glitter, etc.) for children to create winter tree collages.

MATH/MANIPULATIVE—Create a memory or matching game using pictures of the same trees in the outdoor area taken in the summer, fall and winter.

READING—Look how the artist depicted the trees in the winter illustrations in *See How the Turkey Grows*. Talk about how he made it look so cold in the illustrations that you can almost feel the cold. Discuss how the trees survived and helped the turkeys.

WRITING—Put out small blank booklets for the children to write winter tree stories, including animals that use the trees.

PLANTS AND ANIMALS IN WINTER

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Brainstorm locations of plants and animals during the winter
- Look for evidence of plants and animals during winter in an outdoor area
- Record 2 plants and 2 animals during winter in their science notebook pages using words and drawings

GLES ADDRESSED

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals
EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)
SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~
SI.1.D.1, 2 & 3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings and maps, ~~data tables, graphs (bar, pictograph)~~, writings

MATERIALS

- Chart paper
- Markers
- Science notebook pages
- Pencils
- Digital camera (optional)
- Winter day

TEACHER PREPARATION

- Scout area to determine boundaries for children and what they might encounter
- Identify and resolve any safety issues
- Gather science notebook pages and pencils
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside to prepare them for the investigation. Remind children of the plants and animals they identified in the same area in the fall.
2. Discuss with the children where they might find plants and animals or evidence that plants and animals have been in the area.
3. Ask the children to get out their scientist eyes to investigate the playground or outdoor classroom. They are going to look for plants and animals. Ask each child to find and draw evidence of at least 2 plants and 2 animals. After drawing them, ask children to write under each drawing how this plant or animal has changed since fall, making note that some may not have changed.
4. Allow the children to explore the outdoor space. The teacher can record the children's investigations with the camera, taking pictures of the evidence of plants and animals they discover. Talk with children as they work asking questions about their findings.
5. As the children finish, gather them together to discuss their findings. If the weather is very cold, move the discussion inside.
6. Make a list of the children's discoveries. Brainstorm ways the play area changed as the seasons changed from fall to winter. Record their ideas on the chart paper.

7. Discuss how those changes affected the plants and animals. Make a list of ways plants and animals cope with winter.
8. Lastly, talk about how the seasonal changes changed the children's experiences in the area. Talk about what they had to do in the fall to be comfortable in the area and what they had to do during this investigation. Record their ideas on another piece of chart paper.

QUESTIONS FOR DISCUSSION

- What happened to the plants that were here when we looked for plants in the fall? What happened to the animals?
- What plants and animals can you find in the winter?
- What do plants and animals need in the winter to survive?
- How does winter weather affect plants and animals?
- How does winter weather affect people?
- What can people do in the winter that they cannot do during any other season?

ASSESSMENT

Science Notebook	Recorded using developmentally appropriate drawing of and writing about 2 plants and 2 or more animals depicted in winter	Recorded using developmentally appropriate drawing of and writing about 1 plant and 1 animal depicted in winter	Recorded using developmentally appropriate drawing of and writing about either a plant or an animal depicted in winter
Final Discussion	Contributed 2 or more ways the area changed from fall to winter	Contributed at least 1 way the area changed from fall to winter	Listened to ways the area changed from fall to winter
	Identified 2 or more ways plants and animals change or adapt in winter	Identified 1 way plants and animals change or adapt in winter	Listened to ways others suggested that plants and animals adapt to winter
	Suggested 2 or more ways that people adapt or activities they can do during winter	Suggested 1 way that people adapt or activities they can do during winter	Listened attentively but did not contribute to discussion

LEARNING CENTER ACTIVITIES

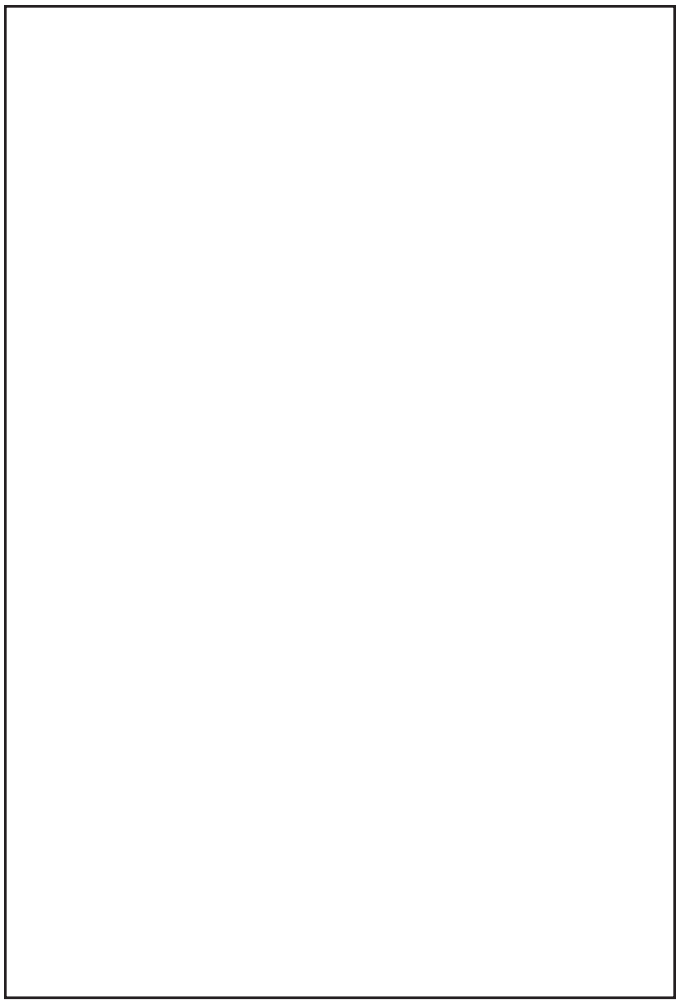
READING—Look at the winter scenes in *See How the Turkey Grows*. Search for plants and animals in the winter illustrations.

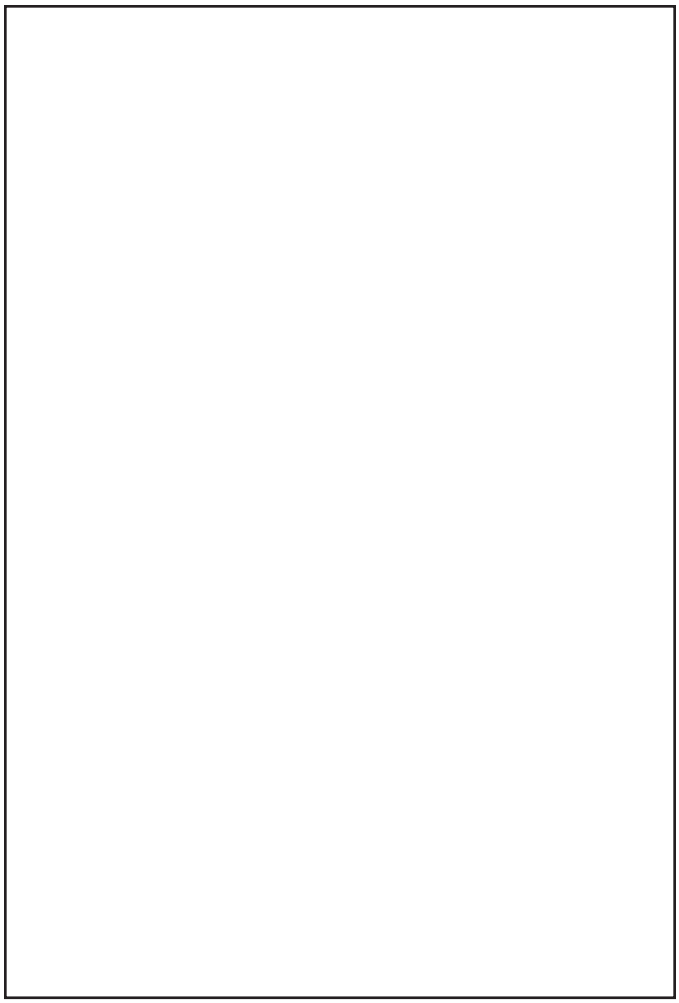
SCIENCE—Bring in flowers (Queen Anne's lace, ironweed, thistle, etc.) that have died for children to investigate. Include hand lenses and sketching materials as well as photographs from when the flowers were in bloom.

SCIENCE—Ask children to revisit the area map created in the fall to investigate how the area has changed or location of plants and animals has changed.

OUTSIDE—Point out to children that their breath forms a cloud when it's cold outside. This is caused when their warm, moist breath is cooled by the cold air around it.

PLANTS IN WINTER





Draw 2 plants that you found.

How have these plants changed since fall?

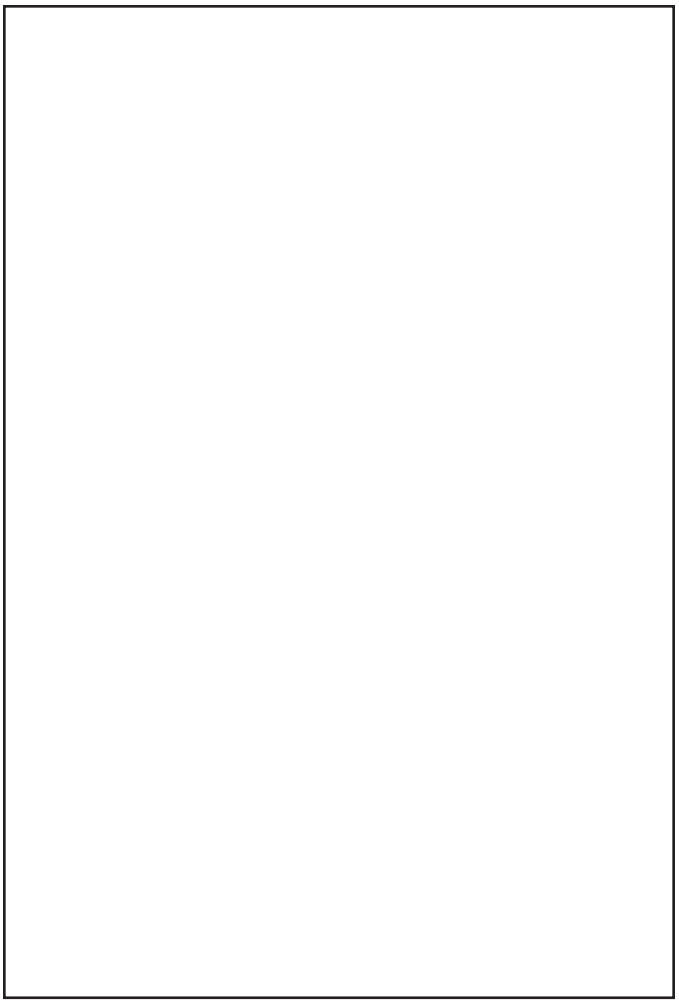
_____ _____

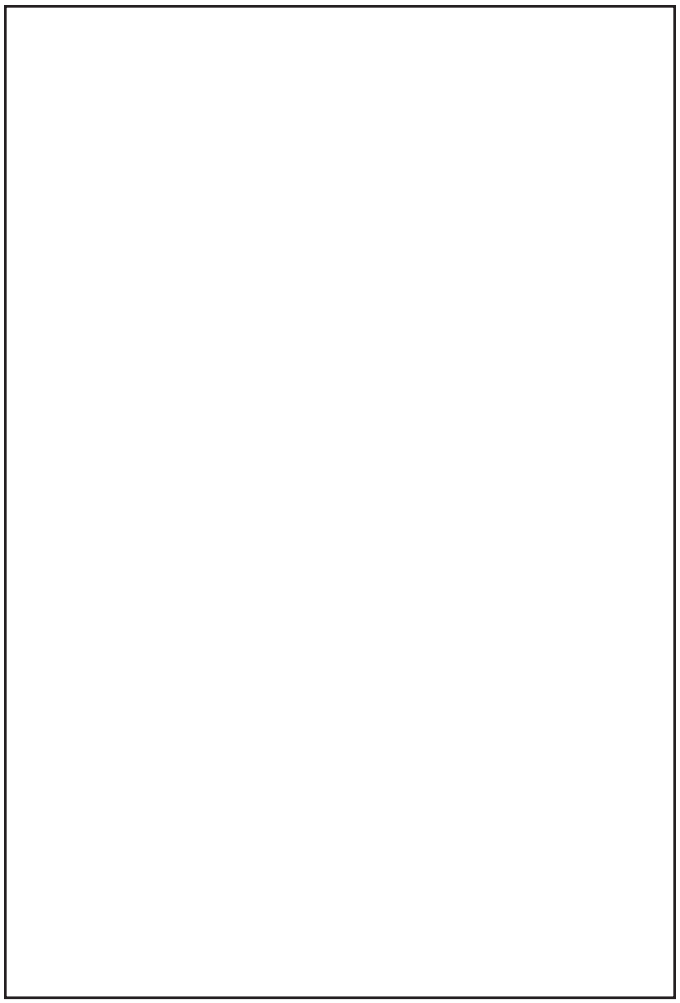
_____ _____

_____ _____

_____ _____

ANIMALS IN WINTER





Draw 2 animals that you found.

How have these animals changed since fall?

_____ _____

_____ _____

_____ _____

_____ _____

WINTER BRINGS CHANGES

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Discuss the 4 ways most animals adapt in winter (remain active, hibernation, dormancy or migration)
- Identify the ways some of Missouri's plants and animals adapt in winter

GLES ADDRESSED

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals
EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

MATERIALS

- Cards printed with 4 adaptations (remain active, hibernation, dormancy and migration) and strung with yarn to be hung around necks as signs
- Props to represent 4 adaptations (for example—heavy furry coat or blanket for remaining active, alarm clock for hibernation, furry robe and slippers for dormancy and suitcase or backpack for migration)
- Animal cards

TEACHER PREPARATION

- Create adaptation signs—remain active, hibernation, dormancy and migration
- Gather props and cards

PROCEDURE

1. Gather children in group. Talk with them about the changing weather and how people, animals and plants all must adapt or change so they can survive. Ask children what would happen to them if they kept wearing their shorts, t-shirts and sandals that they were wearing at the beginning of school. Just as they change clothes to adapt to survive in changing weather, so must the plants and animals.
2. Introduce the terms remaining active (this is what people do—we put on our warm clothes and coats and continue working and playing), hibernation (this means changing body functions to a slower rate to survive), dormancy (sleeping part of the time but waking on warm days to move about) and migration (moving to a warmer climate).
3. Ask 4 children to represent each of the 4 survival strategies. Talk with children about which props should represent which adaptation. Children representing the strategies should put on or hold the props and wear the signs. They should then stand apart on the 4 corners of the meeting area.
4. Distribute the animal cards to the remaining children. They should take turns acting out their animals. Once the class has guessed the animal, then the child should move near the winter survival strategy used by that animal. If classmates disagree with a child's choice, research can be done to find out which adaptation that animal utilizes to survive the winter.
5. Teacher should encourage the children to use the new terms throughout the activity and add them to the word wall.

QUESTIONS FOR DISCUSSION

- How do plants and animals know what to do to adapt to winter?
- What happens when something happens to keep animals from adapting?
- How do people adapt to winter?

ASSESSMENT

Game	Actively participates considering carefully what each animal does to adapt to winter for most of the game	Actively participates considering carefully what each animal does to adapt to winter for part of the game	Actively participates considering carefully what each animal does to adapt to winter for very little of the game

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Make animal cards available so children can sort them by how the animals adapt to winter during center time.

READING—Look for animals throughout *See How the Turkey Grows* and discuss how they adapt to the winter.

SCIENCE—Place field guides in the area along with animal cards so children can research what the animals do in winter.

REMAIN ACTIVE

HIBERNATION


DORMANCY
MIGRATION

PREDATOR-PREY

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Explore predator-prey relationships
- Discuss ways prey avoid being eaten
- Discuss ways predators catch food
- Review special structures that each has to assure its survival

GLES ADDRESSED

LO.1.A.1.a Identify the basic needs of most animals (i.e., ~~air, water~~, food, shelter)
LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals
LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering)
LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., ~~taking in water~~, support, movement, obtaining food, ~~reproduction~~)
SI.1.D.1-3.a Communicate simple procedures and results of investigations and explanations through: ~~oral presentations, drawings and maps, data tables~~, graphs (bar, ~~pictograph), writings~~

MATERIALS

- Chart paper
- Marker
- Animal cards
- Stapler
- Green yarn cut in 1–2" pieces
- Chart for Rounds #1, #2 and #3
- Velcro tabs
- Stop watch or clock with a second hand
- Paper long enough to create head bands
- Small snack size plastic bags marked with tape to indicate the half-full level

TEACHER PREPARATION

- Create a band that will go around each child's head.
  - Copy and cut out the large fox and rabbit images and attach these to the head bands
  - Make one fox headband for every eight rabbit head bands
- Cut yarn and scatter it all over the outside area where the activity will take place
- Place masking tape on bags indicating the half-full level
- Cut out small rabbits and foxes and attach gripping side of Velcro tabs to each
- Prepare chart for Rounds #1, #2 and #3 by attaching the other side of Velcro tabs to each square under each round

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. This learning activity can be done completely outside if the weather is appropriate or started inside with only the final portion outside.
2. Gather children in a circle, passing out animal cards to children. As children are settling down, ask them to consider what food their animal eats.
3. Explain that animals that eat plants are called herbivores, animals that eat animals are carnivores and animals that eat both plants and animals are called omnivores. Ask children to divide themselves into groups of herbivores, carnivores and omnivores. Discuss their ideas about where their animal belongs in the groupings.
4. Discuss that herbivores often become prey to carnivores and omnivores. Ask carnivores and omnivores if any of the herbivores look tasty to them.
5. Ask children to brainstorm defenses that herbivores have that might prevent them from being eaten. Ideas might include sensory structures like eyes, ears, noses, tongues and/or antenna to sense prey, appendages like legs and wings to assist in escape and body coverings for protection. Throughout this discussion, herbivores should look

at their animals and determine how else they could escape predators, the animals that are trying to eat them.

6. Predators also have structures that assist them in catching prey. On another piece of chart paper, brainstorm this list. It will be similar to the herbivore list.
7. Once children complete the brainstorming process, explain that they are going to play a predator-prey game.
8. Select children to be the foxes and the rabbits according to the number of fox and rabbit ears prepared.
9. At this point, the activity should move outside.
10. Explain to the children that it has been a very cold winter. The rabbits have had a difficult time finding food and so have the foxes. The snow has started melting, and rabbits have discovered green plants under parts of the snow. They are very hungry and eating all they can find. They must gather as much food as possible and put it into their stomachs (bags). The rabbits need to fill their stomachs at least half full (to the tape) to survive. Chart the number of foxes and rabbits you begin the game with by placing one cut out rabbit per child wearing a rabbit head band and one cut out fox for each child wearing a fox head band on the chart under Round #1 column. Note: Create a larger chart for the rounds to incorporate more rabbits and foxes into the game.
11. The foxes are also quite hungry and searching for rabbits. They need to eat at least 3 rabbits each to survive. When a fox tags a rabbit, consider the rabbit eaten and it must move with the fox to the fox's den (an area designated by the fox). Foxes may take only one rabbit to their den at a time.
12. A round lasts one minute.
13. At the end of a minute, any foxes that don't have 3 rabbits and any rabbits that don't have a food bag filled to the tape move to the side and become part of the soil. Chart the number of foxes and rabbits who survived.
14. Repeat the simulation with reduced numbers. Again, chart the results.
15. When the children are finished playing the game, talk about what happened. Review the predator-prey relationship and the plight of both the predator and the prey that don't have enough to eat.

QUESTIONS FOR DISCUSSION

- What can prey do to keep from being eaten?
- What can the predator do to make sure it gets food?
- What happens when predators don't catch any prey?
- What happens when all of the prey is eaten?

ASSESSMENT

Discussion	Accurately identified what animal pictured on card ate	Accurately identified what animal pictured on card ate with some support	Attempted to identify what animal pictured on card ate
	Identified 3 or more structures that assist predators and/or prey	Identified 2 structures that assist predators and/or prey	Identified 1 structure that assists predators and/or prey

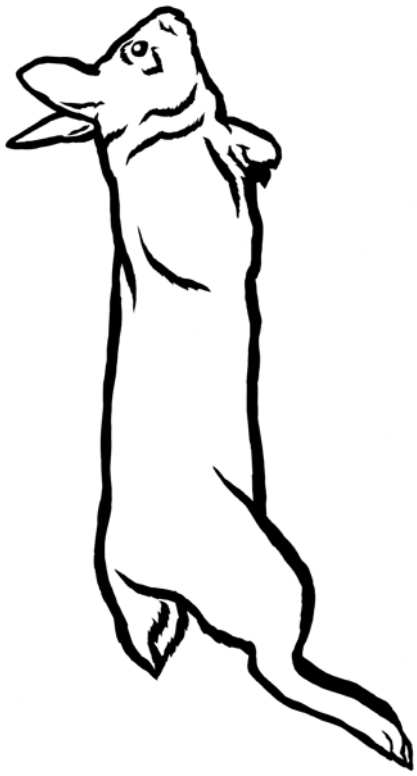
LEARNING CENTER ACTIVITIES

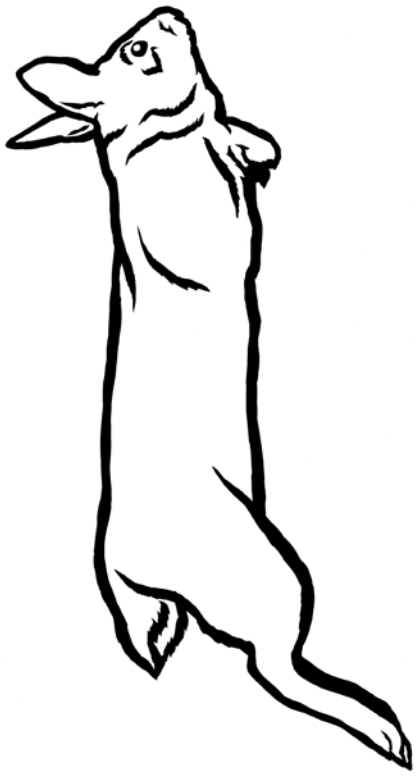
MATH/MANIPULATIVE—Put out animal cards and challenge children to sort them into predator-prey or herbivore, carnivore or omnivore.

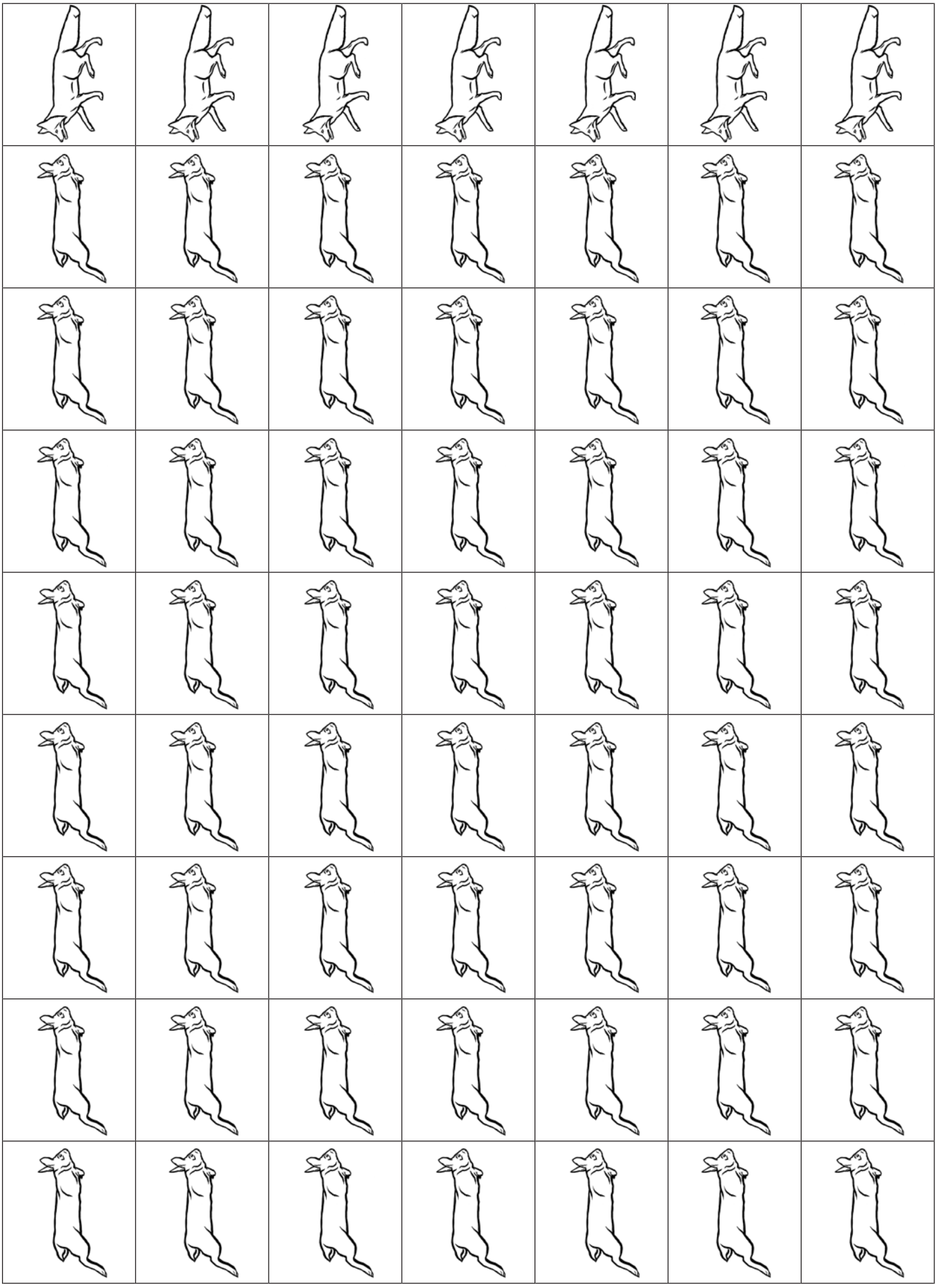
MATH/MANIPULATIVE—Create a set of cards the same size as the animal cards. Label an appropriate number herbivore, carnivore and omnivore. Use these to play memory or concentration, matching the pictures of animals with the type of eater they are.

SCIENCE—Borrow some animal skulls from the high school biology teacher. Encourage the children to compare and contrast the teeth of herbivores, carnivores and omnivores. Provide mirrors for the children to look at their own teeth and compare and contrast them to those in the skulls.

OUTSIDE—Repeat the game several times varying the ratio of foxes to rabbits or the amount of food. Chart the results each time and talk about how this influences survival rates.







Round #1		Round #2		Round #3	

WHAT IS SNOW?

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Hypothesize about what snow is
- Investigate to find out what snow is
- Share investigation results with the rest of the class

GLES ADDRESSED

ES.2.E.3.a Describe ~~clouds and~~ precipitation as forms of water

ES.3.F.1.a Observe ~~and describe~~ ways water, both as a solid and liquid is used in everyday activities at different times of the year (e.g., bathe, drink, make ice cubes, build snowmen, cook, swim)

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

SI.1.A.K.b Conduct a simple investigation (fair test) to answer a question

SI.1.A.1-3.b Plan and conduct a simple investigation (fair test) to answer a question

SI.1.D.1-3.a Communicate simple procedures and results of investigations and explanations through: oral presentations, drawings and maps, data tables, graphs (bar, pictograph), writings

MATERIALS

- Chart paper
- Marker
- Snow
- Hand lenses
- Paper towels
- Thermometers
- Rulers or measuring devices
- Balance scales
- Copies of investigation sheet (one per group)
- Tubs or dish pans for collecting snow
- Clear straight-sided containers for snow (2-liter bottles with the top cut off)

TEACHER PREPARATION

- Determine how to divide children into groups of 2 or 3
- Gather enough materials so children will be able to investigate in small groups
- Make other materials available as requested by groups

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children outside and talk about the weather. Ask children what kinds of things they can do in the snow that they cannot do other times of the year. Record their ideas on the chart paper.
2. Explain that they are going to work in groups to discover what snow is. Provide tubs for children to gather quantities of snow to take inside for investigation.
3. Divide children into groups and provide each group with an investigation sheet. Explain that each group should do the following:
    - Make a hypothesis about what snow is and write it on the investigation sheet
    - Devise a plan to test their hypothesis and then write/draw it on the investigation sheet
    - Gather materials that are needed to test the hypothesis
    - Conduct the investigation
    - Record the results on the investigation sheet
    - Decide how to share the results of the group's investigation with the rest of the class

4. While children are conducting their investigations, the teacher should support their endeavors by finding additional supplies, recording their work with photographs or video, asking questions to guide thinking and actions, etc.
5. Once all are prepared, share investigation results with the entire class. Discuss different ways groups went about the investigation and presentations.

QUESTIONS FOR DISCUSSION

- What can you do in the snow that you cannot do other times of the year?
- Why does it only snow in the winter?
- What is snow?
- How could we find out if your ideas are accurate?
- What materials do you need to conduct your investigation?

ASSESSMENT

Discussion	Identified 4 or more activities that people do in the snow	Identified 2–3 activities that people do in the snow	Identified 1 activity that people do in the snow
Cooperative Group Work	Actively engaged during group investigation and contributed significantly to the group effort	Engaged during most of investigation and contributed to group effort with redirection from the teacher	Minimally engaged during investigation and/or didn't contribute to the group effort
Investigation	Actively worked with group to form a hypothesis, created a simple plan to investigate and carried out the plan	Actively worked with group on 2 of the following 3 tasks: form a hypothesis, create a simple plan to investigate and carried out the plan	Minimally worked with group to form a hypothesis, created a simple plan to investigate and carried out the plan
Recording Data	Assisted in recording data		Minimally assisted in recording data
Group Presentation	Contributed significantly to group presentation, accurately representing the group's work	Contributed minimally to group presentation or inaccurately represented the group's work	Did not contribute to group presentation

LEARNING CENTER ACTIVITIES

READING—Look through *See How the Turkey Grows* to see if the artist provides any clues as to what snow is or what happens to the snow.

SCIENCE—Place several jars with coffee filters or paper towels secured on top with a rubber band at the science center. Encourage children to collect snow from several different sites and place the snow on the filters. Make note of each collection site. Challenge children to predict what will happen. Be sure to record their ideas. Discuss what's left in the coffee filters once the snow melts. Compare the results with where the snow was collected.

WHAT IS SNOW?

Write your group's hypothesis.

Draw and write how your group will test your hypothesis.

Make a list of supplies your group needs to test the hypothesis.

What were the results of your group's investigation?

CATCH A SNOWFLAKE

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Catch snowflakes
- Examine snowflakes with a hand lens
- Compare snowflakes

GLES ADDRESSED

UN.2.C.K.a Observe ~~and describe~~ the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

SI.1.B.K-3.a Make qualitative observations using the five senses

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets~~, ~~equal arm balances, thermometers~~)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple procedures and results of investigations and explanations through: ~~oral presentations~~, drawings ~~and maps, data tables, graphs (bar, pictograph)~~, writings

MATERIALS

- Snowy day
- Hand lenses
- Pencils
- Black piece of paper or felt that has been in the freezer (1 per child)
- Science notebook pages

TEACHER PREPARATION

- Place dark paper or felt in freezer at least 2 hours prior to this observation
- Gather materials
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. During a snowfall, gather children outside.
2. Talk about what it feels like outside.
3. Discuss the sounds when everyone is quiet.
4. Provide each child a frozen piece of paper or felt.
5. Encourage children to catch a snowflake and then examine it with the hand lens.
6. Provide science notebook pages for children to sketch their snowflake. Challenge them to write under the sketch about how it felt, sounded, smelled and looked outside when they caught their snowflake.
7. Once everyone has sketched, compare drawings and talk about the various snowflakes everyone caught.

QUESTIONS FOR DISCUSSION

- Why do you think snowflakes are white?
- How are all the snowflakes alike? Different?
- Why does it snow?
- How do you know when it's going to snow?

ASSESSMENT

Science Notebook Drawing	Snowflake drawing resembled a snowflake, including detail	Snowflake drawing resembled a snowflake, including limited detail	Snowflake drawing resembled a snowflake, but included no detail
Science Notebook Writing	Writing described outside conditions in detail using sensory words as developmentally appropriate	Writing described outside conditions using sensory words as developmentally appropriate	Writing described outside conditions as developmentally appropriate

LEARNING CENTER ACTIVITIES

ART—Encourage children to prepare six-sided snowflakes by folding a square piece of paper diagonally in half, then folding the corners across. Cut off the ends. Then children can cut designs and shapes in the wedge. Open them up to find a unique, six-sided snowflake. Provide glitter and glue sticks for children to decorate. Hang snowflakes from the ceiling.

ART—Provide materials for children to create snowflakes on dark paper using white chalk.

ART—Provide materials for children to color or draw a winter picture. Paint over the entire paper with a solution of Epsom salts and warm water. As the drawing dries, salt crystals will form looking like ice crystals.

MATH/MANIPULATIVE—Make a snowflake counting or pattern game with styrofoam packing and cards illustrating numbers or patterns with snowflakes.

SNOWFLAKE PORTRAITS

Draw your snowflake.

Describe how it sounded, smelled and looked outside.

WHERE IS IT COLDEST?

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Make a hypothesis about temperature differences in various outside locations
- Compare temperatures in various outside locations

GLES ADDRESSED

ES.2.F.1.b Compare temperature in different locations (e.g., inside, outside, in the sun, in the shade)
SI.1.B.K-3.a Make qualitative observations using the five senses
SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., ~~magnifiers/hand lenses, magnets~~, ~~equal arm balances~~, thermometers)
SI.1.B.K-3.d Compare amounts/measurements

MATERIALS

- A cold winter day
- Map of warmest and coolest places in outside area (created in summer)
- 2 labeled pieces of chart paper
- Marker
- Thermometer
- Thermometer stamp and stamp pad
- Unlabeled chart paper

TEACHER PREPARATION

- Scout area to determine boundaries for children and what they might encounter
- Gather materials
- Label the first piece of chart paper "Hypotheses" and the second "Actual temperatures." Divide each chart in half, labeling one side "Warmest" and the other side "Coolest."

PROCEDURE

1. Gather children outside on the playground or in the outdoor classroom. Discuss the weather conditions, especially the temperature.
2. Ask children if they think the warmest and coolest places in the outdoor area are the same in the winter as they are in the summer. Share the map of the warmest and coolest places created in the summer. Talk about if the children think they will be the same in the winter. Challenge them to see if they can find the warmest and the coolest places.
3. When children return, remind them that a hypothesis is an educated guess about something they think they will find. It is based upon what they already know about the phenomena. They should think about what they have learned about the temperature in their outdoor area.
4. Challenge children to make a hypothesis of where they think the hottest place in the outdoor area is and where the coolest is. Record their hypotheses on the chart. Talk about what information they are using to make their hypotheses.
5. Once children have made their hypotheses, use the thermometer to test their ideas. Record the results on the experience chart noting hypotheses that were correct and those that were not. Talk about what makes some places warmer and some cooler in the play area. Discuss changes and what happened to affect the area.
6. Mark their discoveries on a map, either making a new one or adding their new discoveries to the map created during the summer.

QUESTIONS FOR DISCUSSION

- Does the season make a difference in the warmest and coolest place in our play area?
- Where do you think it will be warmest? Coldest?
- Why are some places warmer than others?

ASSESSMENT

Initial Discussion	Contributed during initial discussion and made a hypothesis about the warmest and coolest place	Contributed during initial discussion and made a prediction about the warmest and coolest place	Contributed during the discussion but made neither a prediction or hypothesis
Hypothesis	Provided plausible reason for the hypothesis made		Predicted warmest and coolest place but provided no explanation
Final Discussion	Contributed during final discussion comparing temperatures between different sites	Listened attentively during discussion but did not contribute or make a comparison of temperatures between the different sites	

LEARNING CENTER ACTIVITIES

ART—Challenge children to draw their own map of the outdoor area where the experiment was conducted. Include a key or legend indicating warmest and coolest places in the area. Compare this map with the one they drew in the summer.

SCIENCE—Bring in small, sealed bags of snow. Challenge the children to find a way to melt the snow as fast as they can. Use a stop watch to record times for melting. Chart the methods and results. Talk about what makes the snow melt.

HOW DEEP IS THE SNOW?

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Measure snow depth in different locations in the outdoor play area or classroom
- Record locations and snow depth on science notebook page
- Create a class map indicating the area with the most snow and the least
- Look for patterns in snow depth

GLES ADDRESSED

UN.2.C.K.a Observe ~~and describe~~ the characteristics of the four season as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)
SI.1.B.K-3.a Make qualitative observations using the five senses
SI.1.B.K-3.d Compare amounts/measurements
SI.1.D.K.a Communicate observations using words, pictures, and numbers

MATERIALS

- The morning after a significant snowfall
- Rulers or marking sticks
- Science notebook pages
- Pencils

TEACHER PREPARATION

- Gather materials
- Scout area for deepest and shallowest snow
- Make copies of science notebook pages (one per child)

PROCEDURE

1. Gather children outside and talk about if they have noticed that sometimes there seems to be more snow in some places than others.
2. Ask how this phenomenon might be investigated. If no one mentions measuring the snow, suggest that children could do this in various places in the play area.
3. Encourage children to spread out in the area, measuring the snow with rulers or a stick and recording the results in their science notebook pages. This might be done through drawing or writing, but in addition to the depth of the snow, children should also record the location of the measurement. Teachers should model this process for them in a manner that children will be able to replicate.
4. Bring children back together again and compare their results.
5. Inside, create a class map of the space and mark the places where measurements were taken, indicating the depth of the snow in each place. Speculate with children why the snow is deeper in some places than in others. Consider if there are any patterns to the snow depth (for example, is the snow shallower or deeper next to a wall or building, under a tree, under a play structure, etc.). Features clearly indicated on the map will assist with this process.

QUESTIONS FOR DISCUSSION

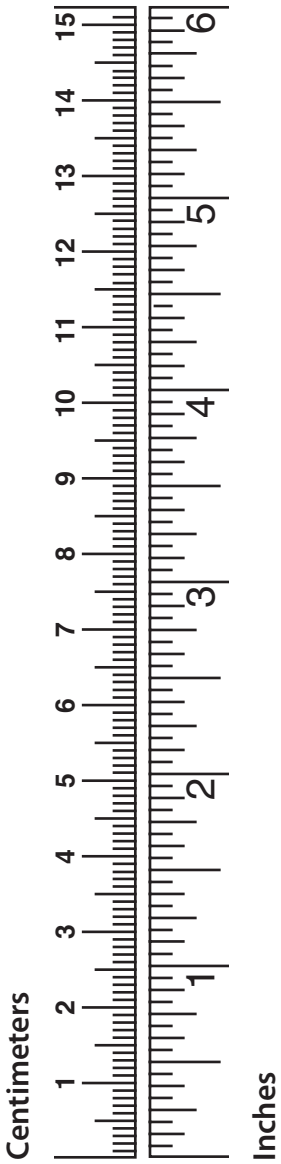
- Where is the snow deepest? Shallowest?
- How could we figure out the depth of the snow in different locations?
- How might we record that information?

ASSESSMENT

Measuring Snow	Deliberately measured snow in specific locations in area	Randomly selected places to measure snow	Did not participate in snow measurement
Science Notebook	Recorded all locations and snow measurements on science notebook pages as developmentally appropriate	Recorded some locations and/or snow measurements on science notebook pages as developmentally appropriate	Recorded no locations and/or snow measurements on science notebook pages
Map Creation	Assisted in creating and marking map with various snow depths	Listened attentively but did not contribute to marking map with various snow depths	

GROUP—Make a class hypothesis about where the snow will be deepest and shallowest the day after the next snow. When it snows, check the depth of various locations in the area to see if your ideas were confirmed.

HOW DEEP IS THE SNOW?



Where was this measurement taken?

PEOPLE IN WINTER

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify characteristics of winter
- Draw self-portraits in winter
- Write activities they like to do in the winter

GLES ADDRESSED

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities, food)

MATERIALS

- Science notebook pages
- Colored pencils or crayons
- 1 piece of chart paper
- Pencils
- Marker
- Chart paper with characteristics of winter developed during the *Trees in Winter* activity

TEACHER PREPARATION

- Gather materials
- Label a second piece of chart paper—"Things people do in the winter"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. After children have been playing outside on a typical winter day, gather them together and show them their previous chart of characteristics of winter. Ask if there is anything else they need to add to the list.
2. Ask children what their favorite winter activities are. Record their ideas on the piece of chart paper entitled "Things people do in the winter."
3. Once children have created the list of activities unique to winter, distribute science notebook pages. Challenge children to draw a self portrait of themselves doing something in the winter. Talk about what they might include in the drawing that would help the viewer know it was winter. Once they are finished with the drawing, they should write what they are doing.
4. Allow children to spread out throughout the outdoor space to draw themselves in winter. If the weather is too cold, take the children inside to draw and write.
5. When finished, gather children back together and suggest that they share their illustrations. Collect the drawings and bind them together to create a class book entitled *People in Winter*.

QUESTIONS FOR DISCUSSION

- What do people do in the winter that they can't do other times of the year?
- What do people wear? Eat? Play?
- What do people do to stay warm?

ASSESSMENT

Discussion	Participated during initial discussion and contributed 4 or more activities people participate in during the winter	Participated during initial discussion and contributed 2–3 activities people participate in during the winter	Participated during initial discussion and contributed at least 1 activity people participate in during the winter
Winter Self-portrait Science Notebook Drawing	Self-portrait clearly indicated winter through clothing, activity and background as developmentally appropriate	Self-portrait indicated winter through clothing, activity or background as developmentally appropriate	Self-portrait hinted at winter through clothing, activity or background as developmentally appropriate
Winter Science Notebook Writing	Writing clearly indicated an activity unique to winter as developmentally appropriate	Writing indicated a winter activity that could also be done at other times of the year as developmentally appropriate	Writing did not reflect an activity that is done during the winter

LEARNING CENTER ACTIVITIES

ART—Create winter mobiles to hang outside. Each child will need 3 plastic lids and a piece of cotton string. Have children collect natural materials like leaves, seeds, dead flowers, etc. Have children place one natural object in the center of each plastic lid. Have children line the 3 lids up in a row and lay the string down the row so it is lying against the natural object in each lid. Fill lids with water then leave them outside to freeze. When they are frozen, pop the ice chunks out of the lids and hang in a tree or window for children to observe.

MATH/MANIPULATIVE—Sort animal and plant cards by those they might see in the winter and those they would not.

PEOPLE IN WINTER

Draw a self-portrait of something you like to do in the winter.

Describe your self-portrait.

PICK A BEAK

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Explore how different types of bird beaks help birds survive
- Experiment with beak tools to find out which works best for each type of food

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals
LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs~~, beaks, ~~appendages, body covering~~)
LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., ~~taking in water, support, movement~~, obtaining food, ~~reproduction~~)

MATERIALS

- Chart paper
- Marker
- Simulated bird beaks listed in chart below
- Pictures of the birds listed in chart below
- Simulated bird foods listed in chart below

Simulated Bird Food	Actual Bird Food	Simulated Bird Beak	Bird
Coffee can filled with wet mud and plastic fishing worms	Worms	Small tongs or children's connected chopsticks	Robin
Acorns	Seeds	Pliers	Cardinal
Parsley floating in bowl of water	Floating aquatic vegetation	Small slotted spoon or strainer	Duck
Plastic insects in an egg carton with a small hole in each section	Insects in a tree	Tweezers	Woodpecker
Sugar water in a narrow mouthed bottle or vase	Nectar	Straw	Hummingbird

TEACHER PREPARATION

- Gather supplies and set up center
- Divide chart paper into 4 columns. Label each column with the headings on the chart above.

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Place the materials, along with the pictures of the birds, in the manipulative area for children to explore during center time.
2. Encourage children to try the different utensils for picking up the food. Challenge them to try to figure out which utensil works best for each food.

3. As they experiment, encourage them to match the beaks with birds that have similar types of beaks.
4. After everyone has had a turn to visit the learning center, gather children as a group and talk about the experience. Ask children what they thought the various simulated foods represented. Go through each food and ask children which simulated beak worked best and which bird they thought it represented.
5. Create a chart similar to the one above.

QUESTIONS FOR DISCUSSION

- What does a bird use its beak for?
- How is this utensil like a bird beak?
- Which utensil works best for each food?
- Which bird has a beak like that?
- What do you think would be the habitat of a bird with this kind of beak?

ASSESSMENT

Bird Beak Simulation	Actively engaged in the learning center experimenting with all of the utensils with the various types of food	Actively engaged in the learning center and tried out most of the utensils with some of the food	Engaged in the learning center but was distracted or didn't try many of the utensils or food
Utensil Matching with Birds	Examined beaks on birds and accurately matched 4–5 birds to simulated beaks and food	Examined beaks on birds and accurately 2–3 matched birds to simulated beaks and food	Examined beaks on birds and accurately matched 0–1 bird to simulated beaks and food
Final Discussion	Actively contributed to discussion, comparing the various bird beaks, the food the birds eat and the type of place where the bird might live	Contributed to discussion, comparing the various bird beaks, the food the birds eat and the type of place where the bird might live	Minimally contributed to discussion, comparing the various bird beaks, the food the birds eat and the type of place where the bird might live

LEARNING CENTER ACTIVITIES

BULLETIN BOARD—Put up pictures and/or a list of birds seen at the feeder. Prepare a chart so children can record sightings at the bird feeders.

MATH/MANIPULATIVE—Use pictures of birds or even just bird beaks or bird feet to create a memory game.

MATH/MANIPULATIVE—Cut out some birds from the bird posters available from the Missouri Department of Conservation. Make a chart of various foods birds eat, such as insects, seeds, small mammals, worms, etc. Encourage children to sort the birds by what they eat.

READING—Read through *See How the Turkey Grows* and look at the adult turkey's beak and the juvenile (young) turkey's beak. Talk about the differences and similarities. Discuss how the turkey's beak is suited to the turkey's habitat.

READING—Place several bird field guides out for the children to research different kinds of birds, what their beaks look like and what they eat.

SCIENCE—Provide materials for children to plant bird seed and see what happens.

SCIENCE—Hang clear plastic feeders with suction cups on the classroom window located near the other outside feeders. Add binoculars and a couple of bird field guides. Encourage children to watch for birds and observe them up close through the window.

GROUP—Work with children to create a word chart based on the five senses of words that describe birds. Place it in the room where children can refer to it as they write in their science notebook pages about birds.

HOME AND SCHOOL CONNECTIONS—Make bird feeders that children can take home (see outside activities for a variety of ideas). Challenge children to keep track of birds that visit their home feeders. Compare these to those that visit during school.

OUTSIDE—Put out identical bowls of different types of food to find out what food birds in your schoolyard prefer. Some foods to try: mixed or songbird seed, sunflower seeds (in shell), peanuts (in shell), suet (animal fat), mealworms (available at bait shops), soft fruit, bread crumbs, soaked oats, etc. Place these outside a window where children can view throughout the day. Be sure to take the food in at night. The food may attract some unwanted visitors.

EXPLORE A FEATHER

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Explore the ways feathers respond in different situations
- Discover unique qualities of feathers
- Write about how feathers help birds

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals
LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs, beaks~~, ~~appendages~~, body covering)
SI.1.A.K-3.a Pose questions about objects, materials, organisms, and events in the environment
SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets~~, equal arm balances, ~~thermometers~~)

MATERIALS

- Bird feathers (legally obtained)
- Pan of water
- Hand lenses
- Balance scale
- Science notebook pages
- Pencils

TEACHER PREPARATION

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Place materials in an area for children to explore during center time.
2. Encourage children to explore the feathers by putting them in water, touching them, examining them with the hand lenses, pulling them apart and putting them back together, flapping them in the air, weighing them on the balance scale, etc.
3. After exploring the feathers, children should draw a feather on their science notebook page and write down their discoveries and what they want to know about feathers and/or birds.

QUESTIONS FOR DISCUSSION

- Why do birds have feathers?
- How do feathers help birds survive?
- How would you describe a feather?
- How can something so light support a bird in the air?
- How did you use the tools to help you examine the feathers?
- What do you want to know about feathers? How could we find out?

ASSESSMENT

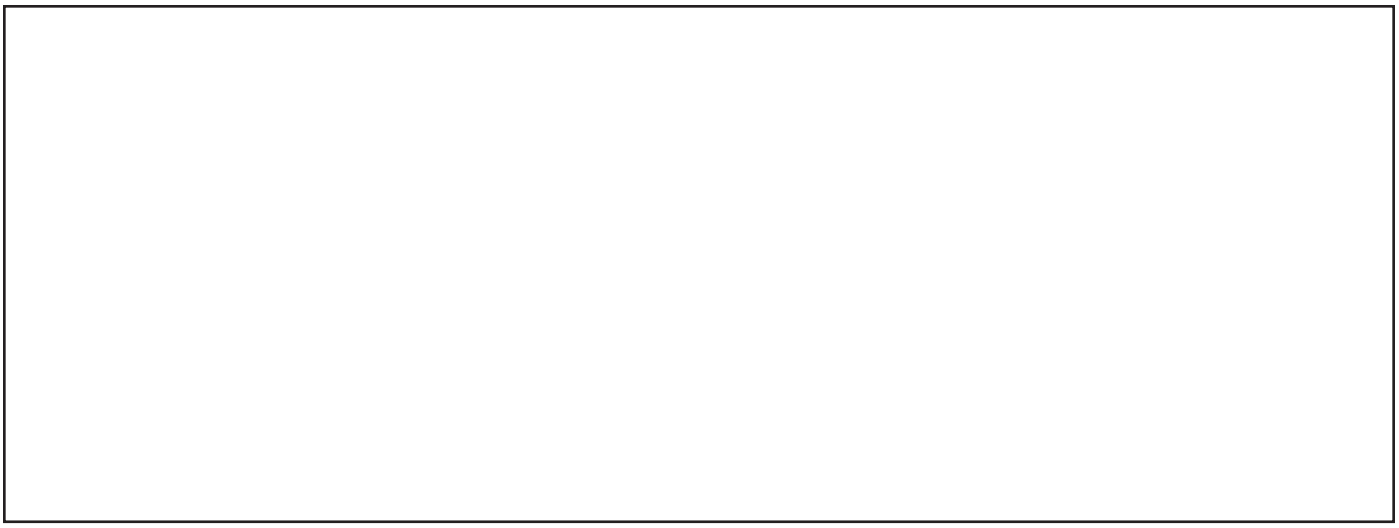
Bird Feather Exploration	Actively engaged in the learning center examining and experimenting with the feathers		Did not engage examine and/or experiment with the feathers
Hand Lens Use	Hand lens was used to assist in examining the feathers	Hand lens was used but not effectively	Hand lens was not used
Balance Scale	Balance scale was used to assist in examining the feathers	Balance scale was used but not effectively	Balance scale was not used
Science Notebook Drawing	Feather illustration is accurate and shows detail as developmentally appropriate	Feather illustration is partly accurate or lacks some detail as developmentally appropriate	Feather illustration is primarily an outline of the shape including no detail
Science Notebook Writing	Identified 2 or more discoveries about feathers as developmentally appropriate	Identified 1 discovery about feathers as developmentally appropriate	Did not identify any discoveries about the feathers
	Wrote a question about feathers/birds as developmentally appropriate		Did not write a question about feathers/birds

LEARNING CENTER ACTIVITIES

SCIENCE—Provide materials for children to follow up on their questions by designing and conducting their own experiments on feathers.

READING—Gather feather field guides and make them available for children to identify birds that grew the feathers they find.

FEATHER EXPLORATION



Draw your feather.

What did you discover about feathers?

_____

_____

_____

_____

What more do you want to know about feathers?

_____

_____

_____

_____

BIRD PUZZLES

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Discuss how bird feet and beaks assist the bird in its habitat
- Match bird feet and beaks to bodies

GLES ADDRESSED

LO.1.A.1.a Identify the basic needs of most animals (i.e., air, water, food, shelter)
LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals
LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering)

MATERIALS

- Chart paper
- Marker
- Felt bird parts
- Flannel board
- Pictures of woodpecker, duck and cardinal

TEACHER PREPARATION

- Prepare felt birds
- Divide chart paper in half labeling one column "What makes a bird a bird" (characteristics) and the other column "How these characteristics help the bird survive"
- Label another piece of chart paper things birds need to survive

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children in a group. Ask them how they know when a creature is a bird. Write their ideas on the chart paper asking questions as appropriate.
2. Once children have a list of characteristics of birds, ask what birds need to survive. Record their ideas on the second piece of chart paper.
3. After children have brainstormed things birds need to survive, go back to the first piece of chart paper and ask them how the characteristics of the bird assist in its survival. Record these responses on the first sheet of chart paper in the second column.
4. Explain to children that one of the centers available will be matching bird beaks and feet to bird bodies. Challenge them to consider where the bird might live and unique things in that habitat that the bird might need.
5. Make materials available for children to explore and match during center time.

QUESTIONS FOR DISCUSSION

- What makes a bird a bird?
- What do birds need to survive?
- How do the bird's unique parts (beak, feet, and feathers) help it survive?

ASSESSMENT

Discussion	Contributed during discussion and named two or more bird characteristics, survival needs and/or how a bird characteristic helps the bird survive	Contributed during discussion and named at least one bird characteristic, survival need and/or how a bird characteristic helps the bird survive	Did not contribute to the discussion but listened attentively
Bird Puzzles	Worked with peers to put the bird puzzles together, talked about which beak and feet belong to each bird and why	Put bird puzzles together but did not discuss why beak and feet match	Did not put bird puzzles together

LEARNING CENTER ACTIVITIES

ART—Make earth clay or Crayola Model Magic available for children to sculpt birds. As they are working, talk about various bird body parts.

ART—Provide small brown paper lunch bags stuffed with crumpled newspaper for children to create stuffed birds. Details can be added with paint and an array of collage materials such as pipe cleaners, construction paper, feathers, etc.

MATH/MANIPULATIVE—Encourage children to sort bird pictures by type of beak and/or type of feet. Discuss if all birds with the same type of beak also have the same type of feet.

READING—Read *See How the Turkey Grows* and talk about how the turkey's feet, beak and feathers helped it to survive in the story.

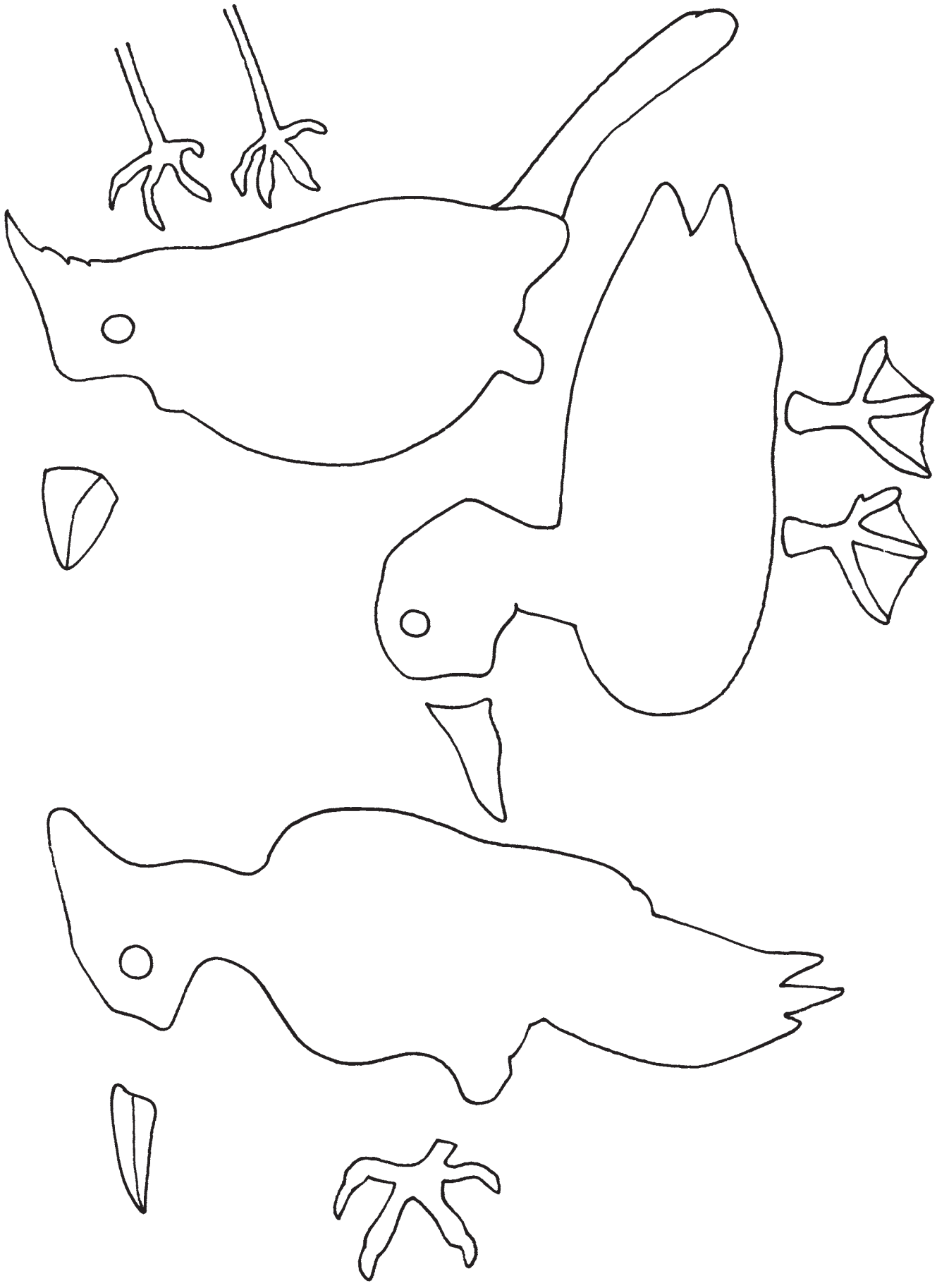
SCIENCE—Challenge children to observe the different ways birds perch and eat at the feeders in the play yard.

WRITING—Put out small blank books for children to name birds they create in the art center, write descriptions of their birds, and describe their habits and habitats.

MUSIC—Teach the children the following song to the tune of *Frere Jacques*:

I'm a cardinal, I am red.	*(fold arms like wings and flap them)*
I have a tuft up on my head.	*(make a point on head with hands)*
I sing a pretty song,	*(flap arms)*
and my bill is small and strong.	*(make beak with fingers)*
So I can crack seeds	*(pretend to peck at seeds)*
when I feed.	

FELT BIRD PARTS



SPRING

WHAT HAPPENS IN THE SPRING?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify characteristics of spring
- Draw pictures of people, plants and animals in the spring

GLES ADDRESSED

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, ~~fall~~, ~~winter~~, spring)

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals.

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities, food)

MATERIALS

- Pencils
- Marker
- 4 pieces of chart paper
- Colored pencils or crayons
- Science notebook pages
- Children's copies of *See How the Turkey Grows*

TEACHER PREPARATION

- Gather materials
- Label one piece of chart paper—"Characteristics of spring"
- Label a second piece of chart paper—"Things people do in the spring"
- Label the third piece of chart paper—"Things plants do in the spring"
- Label the fourth piece of chart paper—"Things animals do in the spring"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

Note: This activity may be easily divided into 3 different activities depending upon time constraints and/or interests of the children.

PROCEDURE

1. Gather children outside on an early spring day. Ask them what time of year it is. Someone is sure to say "spring." Ask how they know it is spring.
2. Read through *See How the Turkey Grows* with the children and talk about which pages depict spring. Ask them to consider how the author and artist indicated it was spring.
3. On the chart paper, record their ideas about how they know it is spring. Provide more guidance by asking how spring is different than the rest of the year. Ask about how the environment changes. Prompt with questions about the weather, plants, precipitation, etc.
4. Once children have provided a number of characteristics of spring, flip to the second piece of chart paper labeled "Things people do in the spring." Ask children to list things they do in the spring that they cannot do other times of the year. List their ideas. Expand their responses with questions about how they dress and what they eat.
5. Flip to the third piece of chart paper and ask the children what happens to plants in the spring.
6. Finally, flip to the fourth piece of chart paper and ask the children what animals they might see in the spring and what they do that doesn't occur during other times of the year.
7. Once children have made many suggestions that distinguish spring for people, plants and animals, distribute science notebook pages. Challenge children to draw a self portrait of themselves doing something in the spring. Talk about what they might include in the drawing that would help the viewer know it was spring. Once they have drawn their self portraits, urge them to write about how their behaviors change in the spring.
8. On the second page, they should draw a portrait of a plant that they find in their outdoor area. Again they should include details that help the viewer know that it is spring. Then they should write about how the plant changed in the spring.
9. On the third page, suggest that they depict an animal in the spring, being careful to include an animal they

might see in Missouri during the spring as well as elements in the picture that suggests spring to the viewer. Writing for this page should include how the animal's behavior changed from the winter to the spring.

10. Allow children to spread out throughout the outdoor space to complete their spring drawings.
11. When finished, gather children back together and suggest that they share their illustrations. Collect them and bind them together to create a class book entitled *What Happens in the Spring?*

QUESTIONS FOR DISCUSSION

- How do you know when it is spring?
- How is spring different than other seasons of the year?
- How do plants look in the spring? Why?
- What is the weather like in the spring?
- What do people do in the spring that they can't do other times of the year?
- What do people wear? Eat? Play?
- What do animals do in the spring that they don't do other times of the year?
- How do they look? Travel? Eat?
- Where do animals live in the spring?

ASSESSMENT

Discussion	Participated during initial discussion and contributed 4 or more characteristics of spring	Participated during initial discussion and contributed 2–3 characteristics of spring	Participated during initial discussion and contributed at least 1 characteristic of spring
Spring Self-portrait Science Notebook Drawing	Self-portrait clearly indicated spring through clothing, activity and background as developmentally appropriate	Self-portrait indicated spring through clothing, activity or background as developmentally appropriate	Self-portrait hinted at spring through clothing, activity or background as developmentally appropriate
Spring Plant Science Notebook Drawing	Plant drawing clearly indicated spring through plant depicted, resemblance to plant in spring, activity and background as developmentally appropriate	Plant drawing indicated spring through plant depicted, resemblance to plant in spring, activity or background as developmentally appropriate	Plant drawing vaguely hinted at spring through plant depicted, resemblance to plant in spring, activity or background as developmentally appropriate
Spring Animal Science Notebook Drawing	Animal drawing clearly indicated spring through animal depicted, resemblance to animal in spring, activity and background as developmentally appropriate	Animal drawing indicated spring through animal depicted, resemblance to animal in spring, activity or background as developmentally appropriate	Animal drawing vaguely hinted at spring through animal depicted, resemblance to animal in spring, activity or background as developmentally appropriate
Spring Self-portrait Science Notebook Writing	Writing clearly indicated 1 or more ways human behavior was affected by the spring weather	Writing hinted at ways human behavior was affected by the spring weather	Writing did not reflect any changes in human behavior due to seasonal changes
Spring Plant Science Notebook Writing	Writing clearly indicated 1 or more ways plant behavior was affected by the spring weather	Writing hinted at ways plant behavior was affected by the spring weather	Writing did not reflect any changes in plant behavior due to seasonal changes
Spring Animal Science Notebook Drawing	Writing clearly indicated 1 or more ways animal behavior was affected by the spring weather	Writing hinted at ways animal behavior was affected by the spring weather	Writing did not reflect any changes in animal behavior due to seasonal changes

LEARNING CENTER ACTIVITIES

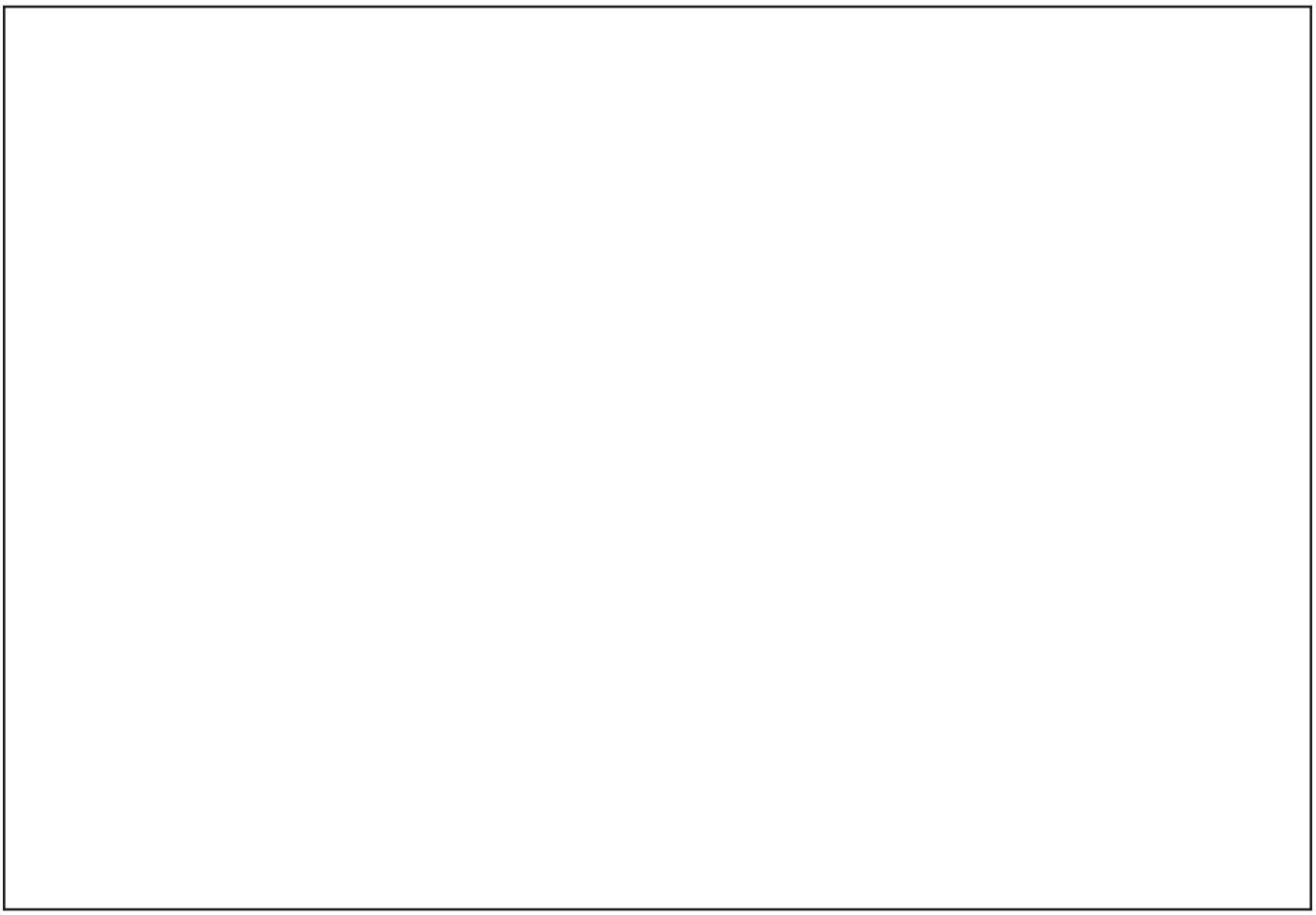
MATH/MANIPULATIVE—Sort animal and plant cards by those they might see in the spring and those they would not.

WHAT HAPPENS IN THE SPRING?

Spring Self-Portrait

What do you do differently in the spring than during the summer, fall and winter?

WHAT HAPPENS IN THE SPRING?



Spring Plant Portrait

How did your plant change from winter to spring?

_____

_____

_____

_____

Spring Animal Portrait

Write about how your animal's behavior changed with the change in weather from winter to spring.

WHERE DO ANIMALS GO WHEN IT RAINS?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Look for animal hiding places in the rain
- Record ideas about animals hiding in the rain
- Talk about what people do when it rains

GLES ADDRESSED

EC1.A.K.a Describe how the seasons affect the behavior of plants and animals
EC1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

MATERIALS

- A rainy day, slow gentle rain
- Laminated animal cards
- Rain apparel
- Science notebook pages
- Pencils
- Chart paper, divided in half and labeled
- Marker

TEACHER PREPARATION

- Gather materials
- Divide chart paper in half with one side labeled "Animal" and the other side labeled "Where it goes in the rain"
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Prepare children to explore in the rain. Before leaving the classroom, distribute the animal cards and challenge children to find places where their animal might go when it is raining.
2. Allow children time to explore the area looking under flowers, bushes, trees, etc.
3. Once back inside or in a dry place, distribute science notebook pages and ask children to draw a picture of their animal in the rain and write about what it does in the rain.
4. Once children have completed their work in their notebooks, bring them together and talk about what they discovered. Record the name of their animal and where they think it would go in the rain on the chart paper. Encourage them to talk about why they think the animal might go there.
5. Brainstorm a list of things that people do in the rain. Talk about how the rain might change both animal and people behavior but not always.

QUESTIONS FOR DISCUSSION

- Where do you go when it rains? Why?
- What do you do when it is raining?
- Do all animals need or want to get out of the rain? Why?

ASSESSMENT

Outside	Actively engaged in looking for places that animals might hide in the rain	Looked for places that animals might hide in the rain but only with teacher redirection	Did not look for places that animals might hide in the rain
Science Notebook Drawing	Drew accurate representation of animal	Drew representation of animal with some inaccuracies	Drew an animal but it wasn't the one on the card
Writing	Described a plausible place (size right for the animal, appropriate kind of shelter for the animal, etc.) the animal might go in the rain	Described a place the animal might go in the rain but wasn't plausible place (size not right for the animal, not an appropriate kind of shelter for the animal, etc.)	Didn't write about a place that the animal might go in the rain
Final Discussion	Contributed ideas about what people do in the rain	Listened attentively during the discussion but did not contribute ideas about what people do in the rain	Did not listen or contribute to the discussion

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Using the places the children found that animals might go in the rain, create a chart indicating each of these places with a picture. Place the chart and animal cards at a center and challenge the children to sort the animals into places they might go in the rain.

WRITING—Ask each child to draw a picture of him or herself depicting environmental changes in the spring. Encourage children to write about things that happen outside that are unique to spring. Bind these together to create a class book entitled *What Happens in the Spring?*

WHERE DO ANIMALS GO WHEN IT RAINS?

Draw your animal in the rain.

Where might this animal go in the rain?

SPRING TREE PORTRAITS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Discuss characteristics of spring
- Explore trees in the spring
- Identify some of the ways trees change from winter to spring
- Create a tree painting
- Record tree facts

GLES ADDRESSED

LO.1.A.1.b Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature)
EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~
UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, ~~fall~~, ~~winter~~, spring)

MATERIALS

- Spring day as trees are beginning to leaf
- The same outdoor area visited during the summer, fall and winter tree portraits
- Chart paper
- Markers
- Cardstock
- Pencils
- Tempera paint in a variety of natural colors
- Small paint brushes
- Water cups

TEACHER PREPARATION

- Select an outdoor area and a place where children may work
- Gather supplies

PROCEDURE

1. Gather children together outside in the sunshine.
2. Ask how they know it is spring. Record their ideas on the chart paper.
3. Brainstorm a list of seasonal changes that have occurred in the outdoor space.
4. Encourage children to think about what trees and other plants need to survive. Discuss the availability of these elements during the spring.
5. Remind the children of their other seasonal tree drawings. Ask how the trees have changed over the course of the year.
6. Talk about the tree parts that are still there (roots, stem or trunk, and branches). Some even may still have their leaves and seeds.
7. Ask children to take off their shoes and socks and again be the tree. Tell them to stand up with their toes digging into the new grass. Feel their roots holding on and drinking up moisture that has come with the spring rains. Now the moisture is moving up through their trunk all the way through their new leaves that are just beginning to emerge. They should lift their branches (arms) high into the sky, swaying as the wind rushes through them, waking the leaves and bringing the tree to life. Close their eyes and be a tree!

8. After pretending to be a tree, encourage children to return to the tree they have been depicting all year. This time, ask the children to first draw their tree very lightly with their pencils. Once the tree is drawn, color and detail can be added with the tempera. Other environmental phenomena may be added to the picture depicting things the tree needs to survive, animals and people using the tree or plants around the tree.
9. When they are finished with their tree portraits and the paint is dry, ask them to turn it over and write 3 facts about trees in spring.
10. Display each child's tree throughout the four seasons along with the map of its location in the outdoor area.

QUESTIONS FOR DISCUSSION

- How do you know it is spring?
- What has changed in our outdoor environment?
- How do the trees look different? The same?
- Why are the trees changing?

ASSESSMENT

Discussion	Participated during initial discussion and stated 3–4 seasonal changes associated with spring	Participated during discussion and stated 1–2 seasonal changes associated with spring	Did not participate in discussion but listened attentively.
Tree Painting	Painting of tree included roots, tree trunk, branches and leaves or flowers depicted in spring as developmentally appropriate	Painting of tree included some but not all parts of the tree depicted in spring as developmentally appropriate	Painting of tree did not resemble tree or was not depicted in spring
Writing	Wrote 2 or more accurate facts about trees in spring as developmentally appropriate	Wrote 1 accurate fact about trees in spring as developmentally appropriate	Wrote about trees but inaccurate information

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Create a memory or matching game using pictures of trees in the outdoor area taken in the summer, fall, winter and the same trees taken in spring.

READING—Look throughout *See How the Turkey Grows* for signs of spring. Talk about how the artist lets the reader know that the season has changed. Discuss changes that occur in the trees and plants depicted in the spring.

SEED COMPARISONS

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Compare radish and lettuce seeds
- Discuss why plants make seeds

GLES ADDRESSED

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem~~, ~~leaves~~, ~~flowers~~, seeds, ~~roots~~)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., ~~absorption of water~~, ~~absorption of light energy~~, ~~support~~, reproduction)

MATERIALS

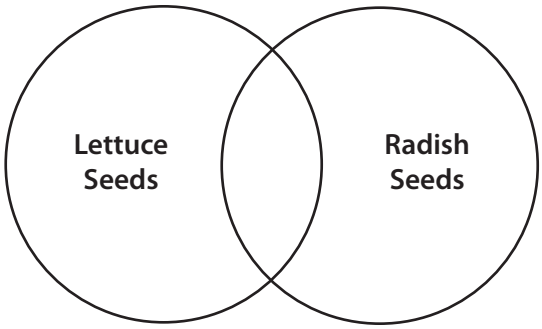
- 2 pieces of chart paper
- Marker
- Radish and leaf lettuce seeds
- Small containers for seeds
- Hand lenses
- Science notebook pages

TEACHER PREPARATION

- Open seed packets and place seeds in small containers with labels or seed packets displayed so children can identify what kind of seeds are in the container
- Set up a center so children can examine seeds on their own
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

- Prepare 1 piece of chart paper with the following Venn diagram:



PROCEDURE

1. Place seeds, hand lenses and science notebook pages in a learning center for children to examine on their own.
2. Challenge children to closely examine, describe and draw the seeds.
3. Once all children have had an opportunity to examine and draw the seeds, bring them together with their science notebook pages. Introduce the Venn diagram, explaining that it is a tool for organizing ideas of how things are different and alike.
4. Talk about how the seeds are the same and how they are different. Encourage children to refer to their drawings to add to the discussion. Write their ideas on the Venn diagram prepared on the chart paper.
5. Once the children have a chart comparing the lettuce and radish seeds, discuss how seeds help the plant. Make a list of their ideas on another piece of chart paper.

6. Display both the Venn diagram and their ideas about the seed's job prominently in the classroom. Save the seeds for the next activity.

QUESTIONS FOR DISCUSSION

- How are the lettuce and radish seeds different? The same?
- How do the seeds help the plant to survive?
- Why do plants make seeds?

ASSESSMENT

Science Notebook Entry	Accurately depicted lettuce and radish seeds with drawings and/or writing	Accurately depicted lettuce or radish seeds with drawings and/or writing	Did not accurately depict either the lettuce or radish seeds
Similarities and Differences Discussion	Participated during discussion and stated 2 or more similarities and differences between radish and lettuce seeds	Participated during discussion and stated 1 or more similarities and differences between radish and lettuce seeds	Participated during discussion and stated either a similarity or a difference between radish and lettuce seeds
Purpose of Seeds Discussion	Accurately stated reasons plants produce seeds (reproduction, producing more plants, making baby plants, etc.)	Listened attentively but did not contribute ideas about why plants make seeds	Did not listen or participate in discussion

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Place a bowl of several different kinds of seeds in a learning center. Label containers with the seed packet envelopes and challenge children to sort seeds into the containers by what kind of seeds they are.

SEED COMPARISONS

Draw the lettuce seeds.

Describe the lettuce seeds.

SEED COMPARISONS

Draw the radish seeds.

Describe the radish seeds.

HOW DOES YOUR GARDEN GROW?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Review things plants need to survive
- Plant radish and lettuce seeds
- Care for the seeds and plants

GLES ADDRESSED

ME.2.C.1.a Identify light from the sun as a basic need of most plants
LO.1.A.1.b Identify the basic needs of most plants (i.e., air, water, light)
LO.1.A.1.c Predict and investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water)

MATERIALS

- Chart paper
- Marker
- One cardboard egg carton with the top cut off per child
- Four extra egg cartons
- Flags with children's names on them (created by taping strips of paper on popsicle sticks or toothpicks)
- Radish and leaf lettuce seeds
- Small containers for seeds
- Soil
- Dish pan or tub
- Water
- Science notebook pages
- Digital camera (optional)

TEACHER PREPARATION

- Cut tops off of egg cartons
- Put soil in tub so children have access to it
- Open seeds and place in small containers with labels showing so children know what they are planting or use containers and seeds prepared for the previous activity
- Set up a center so children can plant seeds on their own
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children together and ask them to remember what they discovered back at the beginning of school that plants need to grow and survive. Record their thoughts on the chart paper. Display the chart in the classroom.
2. Explain that they will have an opportunity to again test their ideas growing lettuce and radishes that they will be able to eat.
3. During center time, encourage the children to fill their egg cartons with soil and plant their seeds in the soil. Make water available for children to water their newly planted seeds.

4. Allow children to place the egg cartons throughout the room in places they think will be most conducive growing conditions. Remind them to check their plant needs list for ideas about where they might place their plants.
5. Distribute science notebook pages and ask children to draw a picture of their newly planted seeds in the place where they decided to place them. Below the drawing, they should write their reasons for placing the plant in that place based upon what they know about what plants need to grow and survive. Be sure to have children date these entries so they can record how the plants change over time. If a digital camera is available, take pictures of each of the children's plantings.
6. While the children are planting their seeds, the teacher should also plant several different egg cartons of seeds and place them in a sunny window. These will serve as a control and insure that at least some of the seeds sprout.
7. Allow children to water the seeds as they remember and think that the seeds need to be watered. Celebrate with them when the first seeds sprout. Just as the children are watering and caring for their seeds, so should the teacher. If a camera is available, take pictures of each point in the growth process.
8. When most of the seeds have sprouted and young seedlings are evident, ask children to find a planting that grew well and draw it, then write what conditions were present to assist the plant in growing. Also ask them to find a plant that didn't do well, draw it and write what happened that caused this plant to grow poorly or not at all.
9. Bring children together with their entries and ask the group to review their findings. Again, make a list on the chart paper of conditions they found that helped the plants to grow and those that prevented or hindered growth. Again, take photographs of seedlings' growth process.
10. Review the findings from the summer sunflower plantings and compare the results.
11. At this point seedlings should be transplanted to a larger container or outside so the plants can grow larger. Seedlings can all be combined or they can be planted into individual plots or containers depending upon space and containers available. Children should continue to care for the plants until they are large enough to harvest and eat. Daily or weekly changes should be drawn as the plants change. This might be done with a small group of children responsible each day or the entire class once a week. Take photographs throughout this growth process.
12. When the plants are nearly ready for harvesting, bring children together and talk about changes in the plants. Review the conditions that were necessary for the plants to reach this point in their growth process.

QUESTIONS FOR DISCUSSION

- What do plants need to grow?
- How long do you think we'll have to wait before anything happens?
- Why did some plants grow better than others?

ASSESSMENT

Initial Discussion	Named at least 2 things plants need to survive	Named 1 thing plants need to survive	Did not participate in discussion but listened attentively
Planting	Planted seeds using an adequate amount of soil and appropriate amount of water		Planted seeds with adult assistance to have adequate amount of soil and water
Initial Science Notebook Entry	Accurately depicted (either with drawing and/or writing) 2 or more things plants need to survive	Accurately depicted (either with drawing and/or writing) 1 thing plants need to survive	Did not depict anything plants need to survive
Seedling Science Notebook Entry	Accurately depicted seedling that grew well and identified 2 or more things that enabled the seedling to thrive (either through drawing or writing)	Accurately depicted seedling that grew well and identified 1 thing that enabled the seedling to thrive (either through drawing or writing)	Accurately depicted seedling that grew well
	Accurately depicted seedling that did not grow well and identified 2 or more things that prevented the seedling from growing (either through drawing or writing)	Accurately depicted seedling that did not grow well and identified 1 thing that prevented the seedling from growing (either through drawing or writing)	Accurately depicted seedling that did not grow well
Growing Plants Science Notebook Entry	Accurately identified changes in plants (either through drawing or writing)		Did not identify any changes in plants (either through drawing or writing)

LEARNING CENTERS

MATH—Place rulers or a measuring device near the plants. Measure plants on a daily or weekly basis. Chart the growth progress as the plants mature.

SCIENCE—Encourage children to bring soil from home. Try putting different soil in each of the egg carton sections and record the results of seeds planted in the different soils.

SCIENCE—Put out materials for children to experiment with other types of planting experiences.

- Substitute empty egg shells for the egg cartons.
- Provide bean seeds, damp paper towels and ziplock bags. Encourage children to place all the materials in the bag, seal and tape bags to the window.
- Have each child bring an old tennis shoe from home and plant a tennis shoe garden.
- Start a sweet potato vine.
- Plant a garden in the play yard.

SCIENCE—Provide different solutions, such as vinegar, lemon juice, etc., for children to water the plants. Make a daily record of the observable effects of each solution on the plants.

WRITING—Challenge the children to create (as a class or individually) a "How To Book" on how to grow radishes or lettuce. Suggest that they include details in both illustrations and writing so others can replicate their project.

HOW DOES YOUR GARDEN GROW?

Date: _____

Draw your seedling in the place where you placed it in the classroom.

Why did you select this place for your seeds to grow?

_____

_____

_____

_____

HOW DOES YOUR GARDEN GROW?

Date: _____

Draw a seedling that grew well.

What conditions helped this seedling to grow?

_____

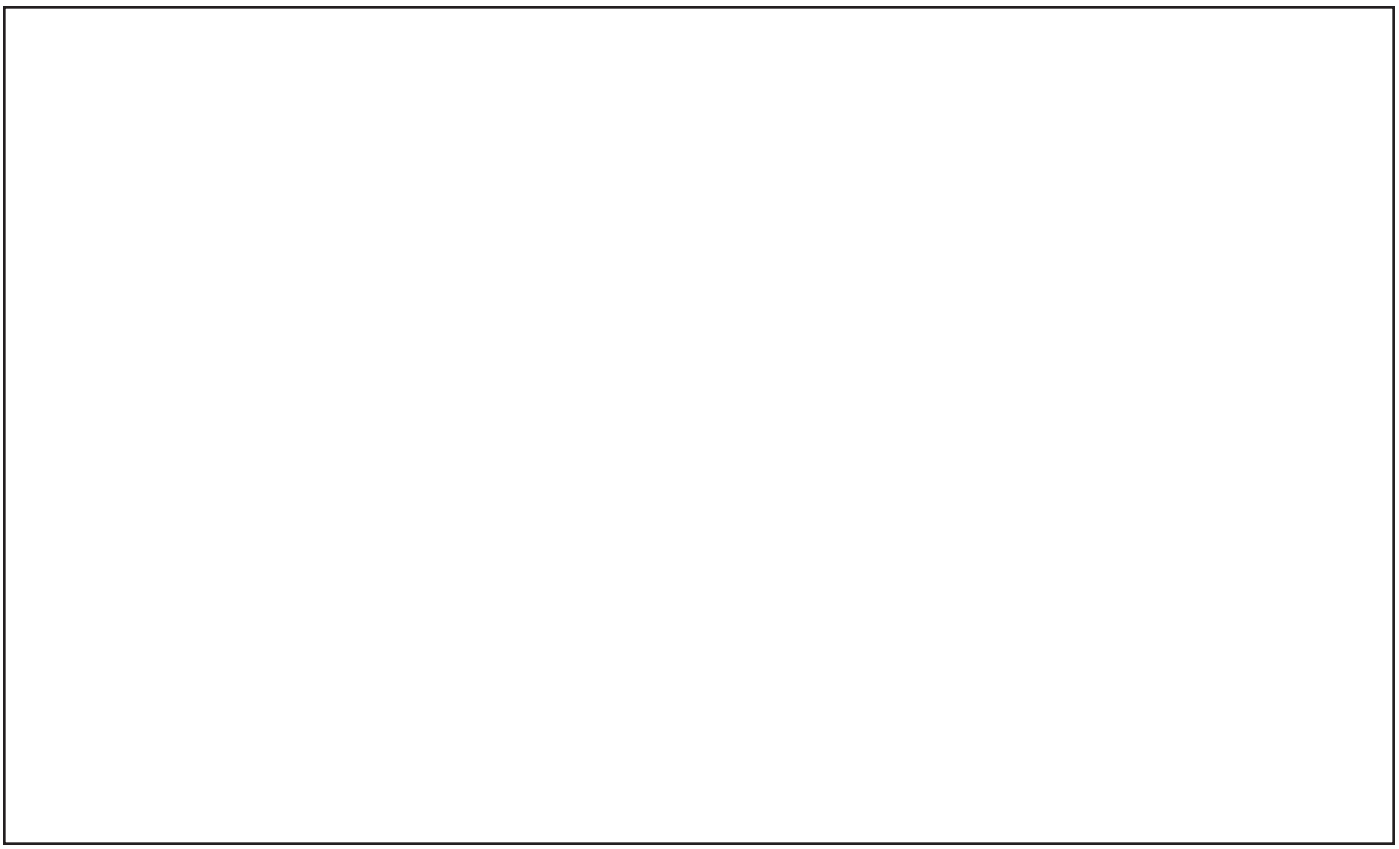
_____

_____

_____

HOW DOES YOUR GARDEN GROW?

Date: _____



Draw a seedling that didn't grow well.

What conditions hindered the growth of this seedling?

_____

_____

_____

_____

HOW DOES YOUR GARDEN GROW?

Date: _____

Draw one of the garden plants.

How has the plant changed since your last drawing?

_____

_____

_____

_____

TASTING RADISHES AND LETTUCE

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Harvest and taste lettuce and radishes
- Draw and label structures of lettuce and radish plants
- Discuss the function of each structure of the lettuce and radish plant

GLES ADDRESSED

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, ~~flowers~~, ~~seeds~~, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, ~~reproduction~~)

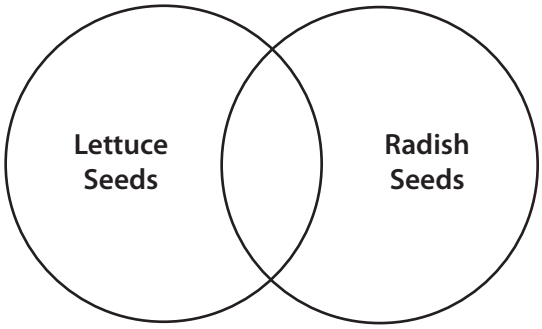
EC.1.A.1.a Identify ways man depends on plants ~~and animals~~ for food, ~~clothing~~, ~~and shelter~~

MATERIALS

- Chart paper
- Marker
- Radish and lettuce plants grown in the previous activity
- Science notebook pages
- Colored pencils
- Hand lenses

TEACHER PREPARATION

- Make copies of science notebook pages (one per child)
- Prepare 1 piece of chart paper with the following Venn diagram:



PROCEDURE

1. When lettuce and radishes are ready to harvest, place one of each plant in a learning center and challenge the children to closely examine the two plants, sketch them and label the plant structures (roots and leaves).
2. Once all children have visited the learning center, bring them together and discuss how they think the two plants are similar and different. Ask them to refer to their science notebook sketches as they talk. Complete a Venn diagram naming similarities and differences in the two plants.
3. On another piece of chart paper, sketch each plant and ask children to assist in labeling the structures. As children are discussing similarities and differences between the two plants, ask them to identify how the plant uses each of these structures. Record their ideas alongside the label.
4. Talk about which structure of these plants people eat.
5. Ask children to assist in harvesting and washing the vegetables. Set up a special snack or tasting center for children to sample the leaves and roots.

QUESTIONS FOR DISCUSSION

- How are the lettuce and radish plants the same? Different?
- How does each part or structure of the plant help the plant grow and survive?
- Which part of these plants can people eat?
- How do people know which part to eat?
- What are some other plants people eat?

ASSESSMENT

Lettuce and Radish Drawings	Drawings are an accurate representation of the lettuce and radish plants as developmentally appropriate	Drawings are partly accurate but also contain some inaccurate parts as developmentally appropriate	Drawings are not based on actual lettuce and/or radish plants
Plant Labeling	Labeling on both drawings accurately included roots and leaves as developmentally appropriate	Labeling on one drawing accurately included roots and leaves as developmentally appropriate	Labeling accurately included roots or leaves on at least one drawing as developmentally appropriate
Discussion Similarities and Difference	Participated during discussion and stated 2 or more similarities and differences between radish and lettuce plants	Participated during discussion and stated 1 or more similarities and differences between radish and lettuce plants	Participated during discussion and stated either a similarity or a difference between radish and lettuce plants
Discussion of Plant Structure Functions	Contributed 2 or more accurate ideas about plant structure functions	Contributed 1 accurate idea about plant structure functions	Listened attentively to the discussion but did not contribute any ideas

LEARNING CENTERS

ART—Provide seed catalogs for children to cut up and create vegetable collages from pictures.

BULLETIN BOARD—Cover the bulletin board with brown paper. Place strips of velcro in rows on the paper. Provide pictures of garden fruits and vegetables velcro attached for children to arrange in the garden.

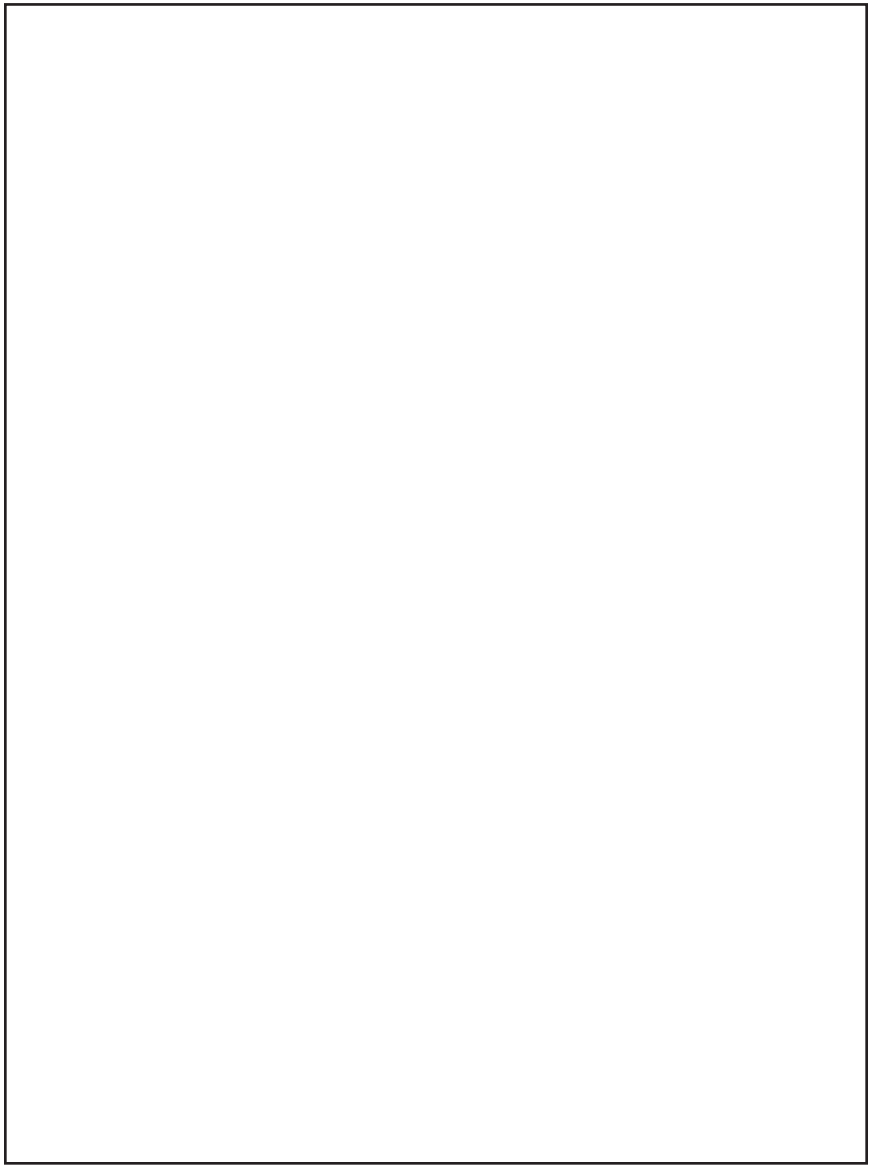
MATH/MANIPULATIVE—Make a food concentration or memory game by placing pictures or stickers (pictures cut from gardening or seed catalogs work well for this) of vegetables and fruits on small cards. Be sure to include a matching set for memory and four sets for concentration. Cards could also be used for sorting by which part of the plant is eaten by people—root (potatoes, radishes, carrots, beets, turnips, onions), stem (celery, rhubarb, asparagus, green onions), leaves (lettuce, cabbage, spinach, many herbs), flower (artichoke, broccoli, cauliflower), fruit (tomato, pumpkin, squash, cucumbers, green peppers, grapes, zucchini, apples, oranges, bananas, avocados) or seeds (corn, beans, peas) or by how the plant structure or part helps the plant (root—absorption of water, leaves—absorption of light energy, stems—support and seeds, flowers, fruits—reproduction or growth of new plants).

MATH/MANIPULATIVE—Fill a grocery bag with empty containers or boxes of various food products (vegetable cans, applesauce jar, herb container, raisin box, jelly jar, dried fruit/vegetable bag, potato/corn chip bag, lettuce bag, sunflower seed bag, frozen food bags, etc.). Provide plain boxes labeled root, stem, leaves, flowers, fruit and seeds. Challenge children to sort boxes, bags and containers into the categories of food parts people eat.

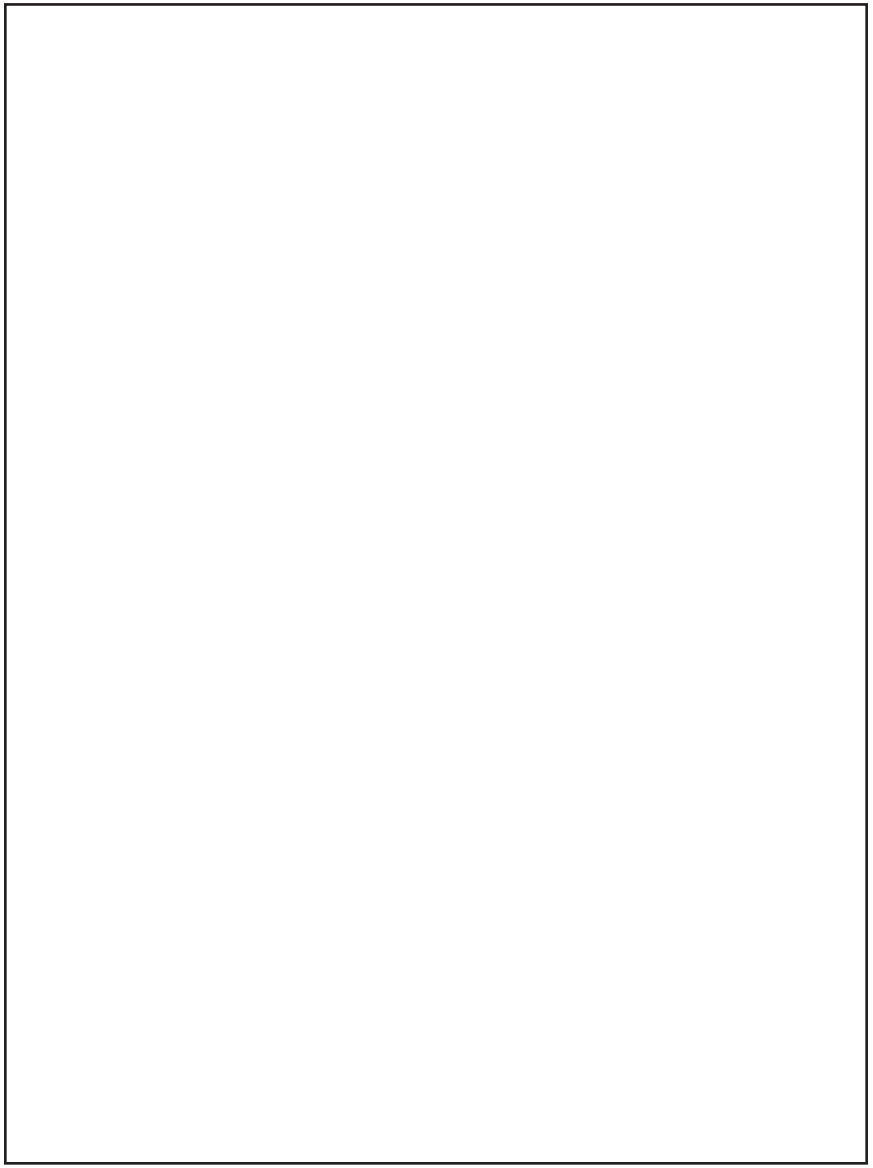
SCIENCE—Place pictures taken during the whole process, from planting the seeds to harvesting the radishes and lettuce, in a learning center and challenge children to sequence the photographs in growth order.

TASTING RADISHES AND LETTUCE

Draw the radish plant and label the structures.



Draw the lettuce plant and label the structures.



SPRING WILDFLOWER OBSERVATION

CHILDREN PARTICIPATING IN THIS EXPERIENCE WILL

- Discuss what spring wildflowers need to survive
- Sketch wildflowers
- Compare structures of different wildflowers
- Sketch and label parts of a wildflower

GLES ADDRESSED

LO.1.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, ~~seeds~~, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, ~~reproduction~~)

MATERIALS

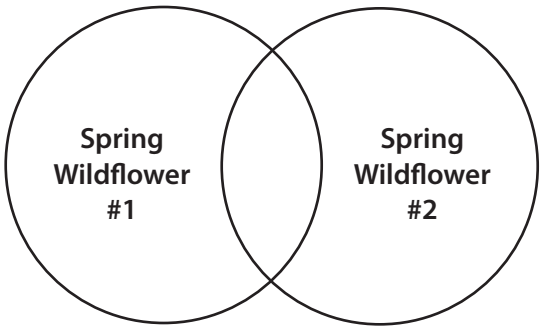
- An area with spring wildflowers that children are allowed to pick
- Chart paper
- Marker
- Two different wildflowers pulled up by the roots
- Missouri wildflower field guide (optional)
- Hand lenses
- Colored pencils
- Science notebook pages
- Digital camera (optional)

TEACHER PREPARATION

- Scout site for spring wildflowers and potential areas and/or plants to avoid
- Collect at least 2 different spring wildflowers, including the roots
- Gather supplies
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

- Prepare 1 piece of chart paper with the following Venn diagram:



PROCEDURE

1. Gather children outside in an area readily accessible to spring wildflowers. Invite children to notice all of the colors and smells around them. Encourage them to remember what they have learned that wildflowers and all plants need to survive.
2. Share the spring wildflowers collected. Challenge the children to compare the two and see what they have in common. Record their ideas on the Venn diagram.
3. Once the Venn diagram is complete, make a quick sketch of the wildflowers collected and label the plant structures as the children name them. Challenge the children to discuss the function of each part or structure of the wildflower. (Many teachers don't like to draw in front of the children, but remember the message sent to children when adults say they can't draw. If we expect children to draw and want to draw, adults must model this for them, just as we do reading and writing.)
4. As with the summer wildflower sketches, talk with children about how many people like to enjoy spring wildflowers. When they are picked they die and not very many people get to enjoy them. So everyone can still enjoy the wildflowers, the children are going to use drawings to study the wildflowers.
5. Challenge children to find different wildflowers in the outdoor environment. They should use their colored pencils to sketch it and label the parts that they can see it has in common with the wildflowers the class examined.
6. Encourage children to spread out and begin their sketching.
7. After everyone is finished, encourage them to share their sketches.

QUESTIONS FOR DISCUSSION

- How are these flowers similar? Different?
- What parts or structures are on this wildflower?
- How does the wildflower use each of these structures?
- How are these wildflowers similar to the ones we sketched last summer? Different?
- Why do you think some wildflowers only grow in the summer and others in the spring and still others from spring until fall?

ASSESSMENT

Similarities and Differences Discussion	Participated during discussion and stated 2 or more similarities and differences between the two wildflowers	Participated during discussion and stated 1 similarity and difference between wildflowers	Participated during discussion and stated either a similarity or a difference between wildflowers
Function of Wildflower Structures Discussion	Contributed 2 or more ideas about the function of the structures of the wildflowers	Contributed at least 1 idea about the function of the structures of the wildflowers	Listened attentively but did not contribute ideas about the function of the structures of the wildflowers
Wildflower Drawing	Drawing is an accurate representation of the flower as developmentally appropriate	Drawing is partly accurate but also contains some inaccurate parts as developmentally appropriate	Drawing is not based on actual wildflower
Wildflower Labeling	Labeling accurately included roots, stem, leaves and flower as developmentally appropriate	Labeling accurately included 2 of the following: roots, stem, leaves, flower as developmentally appropriate	Labeling accurately included at least 1 of the following: roots, stem, leaves, flower as developmentally appropriate

LEARNING CENTER ACTIVITIES

ART—Provide 3×5 unlined index cards for children to create dandelion flip books. Challenge children to illustrate a dandelion at each stage of the growth process—seed, roots sprouting, stem growing, leaves emerging, flower budding, flower blooming, seeds emerging, seeds dispersing on the right side of each index card. Darker colors with illustrations low on the right side of the card will produce the most distinct results. Bind the cards together by tightly wrapping a rubber band around the other end. Flip through the side with the drawings to see a quickly growing dandelion.

ART—Provide watercolor paper and watercolors for children to create watercolor paintings of their wildflowers. Once the paintings have dried, challenge them to use a fine lined permanent black marker to outline and include more details. Identify the various wildflowers and display them in a gallery fashion to create a spring wildflower exhibit.

GROUP—Fill a spray bottle with water and collect pieces of cloth, towels or small blankets and a small snack in a bag for each child. Gather children and explain that they are going to act out the life cycle of a plant. They will begin as a seed. Ask children to lie on the ground and curl up small like a seed. It is fall, and they have just fallen from the plant. Packed into the seed case with them is all the food they need to grow, but they won't need it until spring. Pass out the snacks and encourage the children to curl it inside their hands in the seed, saving it for later. Explain that the days are getting colder. The wind blows, and squirrels are gathering nuts and burying them beneath the soil to find later for a tasty treat. Suggest that they might be a nut being buried. Or perhaps a turkey has scratched them up from the forest floor and tried to eat them. Soon they are covered by leaves (blankets, towels or cloths can be placed on children to simulate leaves and soil) that have fallen from the trees, and the weather is getting colder and colder. One day it snows and completely covers the ground and all the remaining seeds. The small seeds are snug inside their seed cases waiting and sleeping. The days are short and the nights are long, but all of the seeds are lying beneath the snow and soil waiting for a signal to grow. After resting for a long while, the ground begins to get warmer. The small seeds send out a root. Children may stick out one foot or both feet. The plant eats some of the stored food so it will have energy to grow. Encourage children to eat a little of their snack. The root grows longer and is soon followed by a stem. As the days grow warmer and they feel the warm spring rains (mist them with the spray bottle), the stem pops out of the ground. Slowly the stem grows taller and leaves sprout. They gather rays from the sun. The breeze slowly sways the stem and leaves in the warmth of spring. As the plant grows, flowers begin to bud on the plant. At first they are small, but it isn't long before they begin to open and reach toward the sun. These the children can represent by raising the arms with their hands in a fist. The plant basks in the sun, drinks in the rain and grows into a mature plant. The flowers bloom. The children can open their hands like a flower opens but keeping their fingers together. As the days begin to once again grow cool, the flower makes new seeds. Spread out fingers. The cooler winds rustle the plant and the seeds fall to the ground. Flutter fingers to the ground. The life cycle of the plant begins once again.

OUTSIDE—Provide pictures of spring wildflowers on cards and challenge children to find them on a scavenger hunt outside.

OUTSIDE—Once children have completed their sketches, bring them together and compare the wildflowers. Group children by the species of wildflower they sketched. Identify where each species is located in the area. Then create a map of the area with each species of wildflower identified on the map. Discuss their ideas about why each species of wildflower grew in that particular place.

READING—Read through *See How the Turkey Grows* looking for all of the wildflowers throughout the book. Identify what stage of the plant life cycle each is in as the story progresses.

WRITING—Challenge the children to research a wildflower located in the outdoor area routinely visited. Challenge them to illustrate and write a nonfiction piece or "All About Book" about the wildflower researched. It might include what the flower needs to grow, when it blooms, how long it blooms, the parts of the wildflower, a map of where the wildflower is located, etc. These can be made into individual books or bound together for a class created field guide to the wildflowers in the outdoor space.

SPRING WILDFLOWER OBSERVATION

Draw a wildflower and label the roots (if you can see them), stem, leaves, flower and seeds (if you can see them).

FLOWER PUZZLE

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify the parts of a flower
- Discuss the function of each part of the flower

GLES ADDRESSED

LO.1.D.K.a Observe ~~and compare~~ the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~.
LO.1.D.1.a. Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots)
LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, reproduction)

MATERIALS

- Flannel or felt board
- Felt flower puzzle parts—roots, stem, leaves, flower
- Felt labels of flower structures—roots, stem, leaves, flower petals

TEACHER PREPARATION

- Copy the included patterns and use them to cut out felt pieces in appropriate colors
- Set up the flannel board as a center, including the children's science notebook pages in the center

PROCEDURE

1. Set up the felt or flannel board as a center for children to use individually or in small groups. Place the pieces in an open container near the flannel board.
2. As children engage in the center, challenge them to put the flower together while working either individually or in small groups. Felt labels can be used to label the various flower structures. Felt pieces could also be sorted into parts on the flannel board.
3. Encourage the children to talk about the function of each structure of the flower.

QUESTIONS FOR DISCUSSION

- Why do flowers need all of these parts?
- How do each of these structures help the flower?
- How are all flowers alike? Different?
- How are flowers like other plants?

ASSESSMENT

Flannel Board Work	Accurately put the flower puzzle together	Accurately put the flower puzzle together with some assistance	
	Matched 4–5 labels with flower structures	Matched 2–3 labels with flower structures	Matched 1 label with flower structure
	Accurately described with peers or teacher the function of 4–5 flower structures	Accurately described with peers or teacher the function of 2–3 flower structures	Accurately described with peers or teacher the function of 1 flower structure

LEARNING CENTER ACTIVITIES

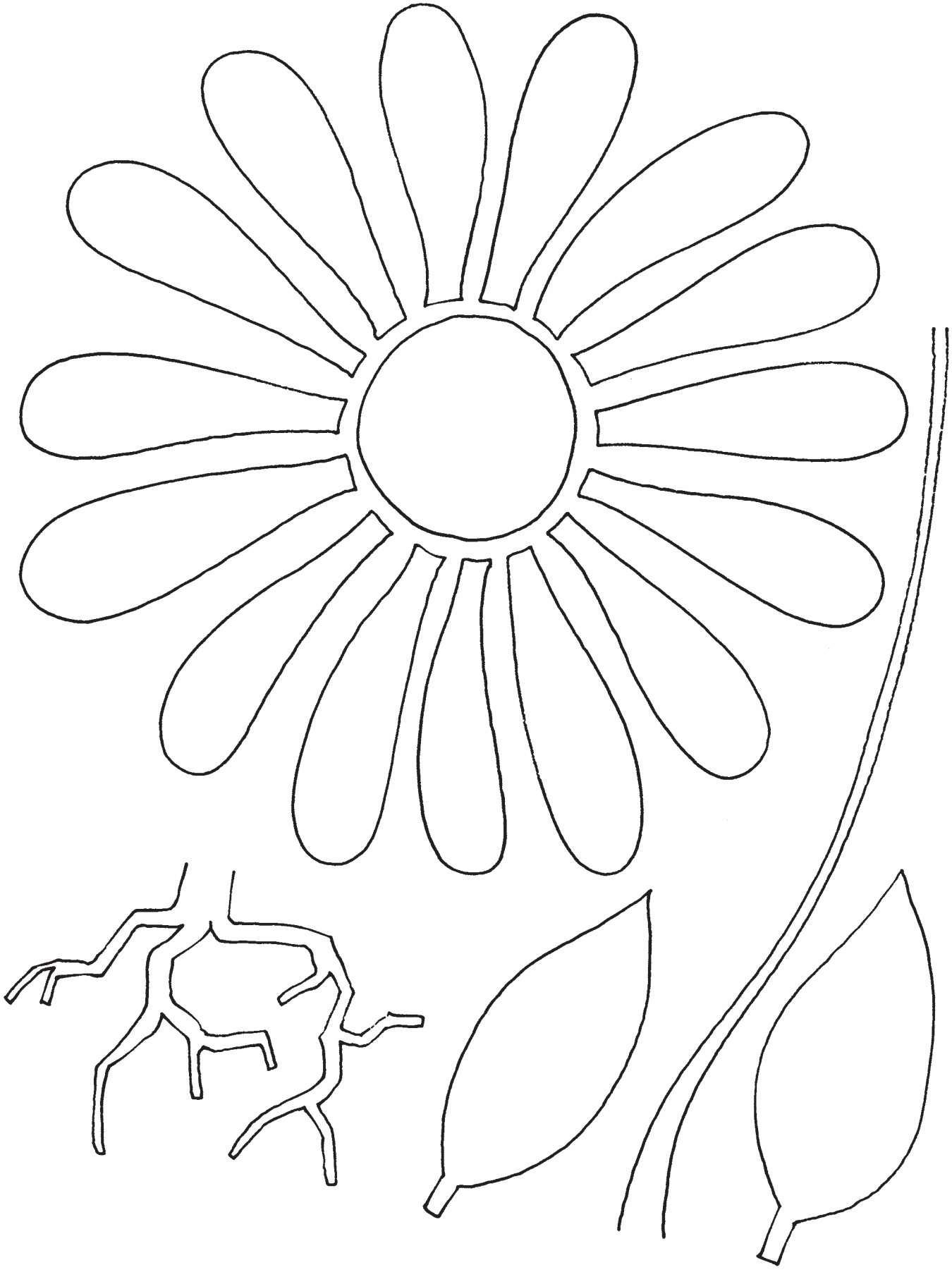
OUTSIDE—Encourage children to look for examples of roots, stems, leaves and flowers in an outdoor play area.

READING—Invite children to look through *See How the Turkey Grows* and find illustrations that show the different flower structures.

SCIENCE—Provide science notebook pages for children to draw and label the parts of the flower after putting together the puzzle.

SCIENCE—Place white carnations and/or Queen Anne's lace and strongly colored water in the science area. Talk with children about what they think will happen when the flowers are placed in the colored water. Encourage them to visit the area and write down their predictions. After everyone has made a prediction, place the flowers in the water and observe throughout the day.

FELT FLOWER PUZZLE PARTS



WHAT HATCHES FROM AN EGG?

CHILDREN PARTICIPATING IN THIS LEARNING EXPERIENCE WILL

- Identify one or more animals that hatch from eggs
- Create an animal that hatches from an egg

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals
LO.1.B.2.a Identify ~~and sequence~~ life cycles (birth, growth, ~~and development~~, reproduction ~~and death~~) of animals (i.e., butterfly, frog, chicken, snake, ~~dog~~)
LO.1.B.2.b Record observations on the life cycle of different animals (e.g., butterfly, ~~dog~~, frog, chicken, snake)

MATERIALS

- Animal cards
- 2 pieces of chart paper
- Marker
- One large plastic egg per child (purchase these around Easter)
- Various sizes of Styrofoam balls
- Styrofoam packing
- Pipe cleaners
- Feathers
- Pompoms
- Construction paper scrapes
- Google eyes
- Glue
- Toothpicks
- Other recycled materials as available and appropriate

TEACHER PREPARATION

- Divide 1 piece of chart paper in half. Label one side "Hatches from eggs" and the other side "Born alive."

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Gather children as a group and remind them of *See How the Turkey Grows*. They know that turkeys hatch from eggs, but ask them to name other animals that hatch from eggs and write these on the chart paper. Ask the children why they think each animal on the chart paper hatches from an egg. If someone names an animal born alive, have the children discuss whether or not that animal belongs on the chart.
2. After making a list of animals that hatch from eggs, distribute the animal cards and ask children to place them on the chart according to whether they hatch from eggs or are born alive.
3. During center time, make the materials available for children to create eggs and animals that hatch from them. Challenge them to make an animal from the list and to create it the way it would look when it emerges from the egg. For example, a butterfly egg would hold a caterpillar, and a frog egg would hold a tadpole. Also suggest that they keep the size of their egg in mind so the animal would fit in the egg.

4. They could be displayed by animal type in a nest appropriate for that animal. For example, if there are several birds, place them together in a bird nest. Caterpillars might have eggs placed on construction paper leaves. Frog eggs could be placed in cellophane arranged to look like water, and snake eggs might be placed in sand. Have children display their finished eggs and animals.

QUESTIONS FOR DISCUSSION

- How do you know which animals hatch from eggs and which are born alive?
- How does the animal inside the egg know when to hatch?
- What do eggs need to hatch?
- How do animals make their nests?

ASSESSMENT

Discussion	Participated during initial discussion and accurately identified 4 or more animals that hatch from eggs	Participated during initial discussion and accurately identified 2–3 animals that hatch from eggs	Participated during initial discussion and accurately identified 1 animal that hatches from an egg
Animal Sorting	Accurately placed animal on chart	Inaccurately placed animal on chart but explained reasoning	Inaccurately placed animal on chart
Animal	Created an animal that hatches from an egg accurately representing the animal at that point in development (frog egg holds tadpole, butterfly egg holds caterpillar, etc.)	Created an animal that hatches from an egg but did not represent it accurately for the stage when it emerges from the egg	Created an animal that is born alive

LEARNING CENTERS

ART—Encourage children to try to make nests using twigs, branches and mud during self-selected activity or free choice time.

GROUP—Play "Mother Bird." One of the children is the mother bird, the rest are the babies. The babies hide throughout the designated outdoor area and peep softly until the mother bird gathers them all into the nest.

GROUP—Discuss with the group how parents in the wild care for their young. A baby bird out of the nest will still be cared for by its parents and doesn't need human assistance. Young wild animals should always be left in the wild as their parents are probably nearby.

MATH/MANIPULATIVE—Make animal cards available for children to sort into those that hatch from eggs and those that are born alive.

OUTSIDE—Encourage children to look for bird nests on the play yard. Be careful not disturb the nest, eggs or adult but observe the progress.

OUTSIDE—Help birds with their next building by draping brightly colored yarn, string and/or ribbon over a pine cone and hanging it in a tree. Look for the bright colors in bird nests discovered in the trees on the play yard.

FROGS AND TOADS

CHILDREN PARTICIPATING IN THE LEARNING EXPERIENCE WILL

- Listen to a story about the life cycle of a frog
- Explore how tadpoles and froglets or toadlets are different than and the same as their parents
- Talk about the life cycles of the frog and toad
- Retell the story emphasizing the life cycle of a frog and toad

GLES ADDRESSED

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., ~~butterfly~~, frog, ~~chicken~~, ~~snake~~, ~~dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., ~~butterfly~~, ~~dog~~, frog, ~~chicken~~, ~~snake~~)

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

MATERIALS

- Flannelboard
- Felt characters
- Chart paper
- Marker

TEACHER PREPARATION

- Use the included patterns to create felt pieces for the flannelboard (pgs. 222 & 223)
- Review the story so felt pieces can be added to the story at the appropriate time
- Divide one piece of chart paper into 3 sections labeled "Egg," "Tadpole" and "Frog/toad." Divide each of these sections in half and label one side "Alike" and one side "Different."

See "Children's Literature Recommended in Activities" beginning on page 199.

PROCEDURE

1. Before reading the story, review with the children what they have learned throughout the year about life cycles. A life cycle is a series of changes that every living thing goes through. For animals, it begins the minute a baby begins growing in an egg and continues until death. Not every creature has the same life cycle, but all follow a predictable pattern.
2. Explain that the story they are going to read together is about the frog and toad life cycles. Read through the story placing the felt pieces on the flannelboard at appropriate points throughout the story.
3. Once the story is finished, go through the story again with the children talking about each stage that the frogs and toads went through. Encourage the children to place the flannelboard pieces on the board at appropriate points throughout the story.
4. On the labeled piece of chart paper, introduce children to the terms describing the stages they just identified—egg, tadpole and frog/toad. Use the felt pieces to examine the frog/toad life cycle at each stage noting how the young are similar to the mother and different. Write down all of the children's ideas, making sure to point out things that they miss, including where the frog/toad lives at that point in the life cycle.
5. Talk about what happened to all of the frogs and toads in the story. Discuss reasons why frogs and toads lay so many eggs and what would have happened to the animals who ate the young frogs and toads if there had not been so many.
6. After discussing the story, place the flanneboard pieces in a learning center and challenge the children to retell the story to one another during center time.

In a very shallow pond
where you could walk and wade,
in among the weeds and grass
were gobs of gooey eggs.

Small black eggs in slimy jelly
made in long thin lines,
other eggs in big huge hunks
wrapped up in globs of slime.

Along came a snapping turtle.
He ate a slimy batch.
But many eggs were left untouched
soon they began to hatch.

From the eggs came tadpoles.
They wiggle when they swim.
Along came a hungry fish
and ate a bunch of them.

But more were left, and as time passed
they began to grow.
Soon they started sprouting arms
legs and feet and toes.

The tadpoles tails began to shrink.
They used their legs to swim.
Along came a hungry heron.
He ate some more of them.

They swam up from the bottom
to sunlight shining there.
They poked their heads out of the pond
and started breathing air.

Up out of the water
they crawled toward the shore.
Along came a hungry snake
and gobbled up some more.

They jumped out of the water.
They hopped and jumped on logs.
The tadpoles from the farm pond
had changed to toads and frogs.

Out flashed their sticky tongues.
They gobbled bugs and flies
and whatever they could swallow
if it happened to crawl by.

Some had skin smooth and sleek.
Their hops were strong and long.
They could jump into the water,
if they thought something was wrong.

They were better swimmers.
They would sunbathe on a log.
They were big and quick and strong.
We always call them frogs.

Then there were the others.
They were fat and short.
Their skin was rough and covered
with many bumpy warts.

They were small and stocky.
Their hops were short and slowed.
They weren't good at swimming.
They are known as toads.

Along came a coyote
looking for a meal.
He jumped into the toads and frogs.
He gave a hungry squeal.

The frogs were fast. They jumped away
as fast as they could go.
But the coyote snapped a toad right up.
The toad was much too slow.

Breakfast for the coyote.
He started to bite down.
Bleck! The toad, it tasted bad.
He spit it on the ground.

The warts that cover toad skin
make them horrible to eat.
The coyote had to go and search
for better tasting meat.

—Story by John Griffin

QUESTIONS FOR DISCUSSION

- How are frogs and toads like their mothers? How are they not like their mothers?
- What do tadpoles need to become frogs or toads?
- What would happen to the animals if they didn't eat the young frogs and toads?
- Why do you think frogs and toads lay so many eggs?
- Why do you think frog and toad eggs look different from each other?

ASSESSMENT

Discussion of Story	Actively contributed to discussion, pointing out changes in the frogs and toads as the story progressed.	Attentively listened to the discussion but did not contribute
Identifying Similarities and Differences	Suggested 2 similarities between young frogs and toads and the adults	Suggested 1 similarity between young frogs and toads and the adults
	Suggested 3–4 differences between young frogs and toads and the adults	Suggested 1–2 differences between young frogs and toads and the adults
Story Retelling	Retold all stages of the life cycle of the frogs and toads in accurate order	Retold some of the life cycle of the frogs and toads but omitted parts or did not order accurately

LEARNING CENTER ACTIVITIES

ART—Encourage the children to create a map of the area the frogs and toads in the story traveled, indicating places where key events occurred .

ART—Provide 3×5 unlined index cards for children to create frog or toad flip books. Challenge children to illustrate a frog or toad at each stage of the growth process (eggs, small tadpole, larger tadpole, tadpole with back legs and smaller tail, tadpole with back and front legs and still smaller tail, frog, frog laying eggs) on the right side of each index card. Darker colors with illustrations low on the right side of the card will produce the most distinct results. Bind the cards together by tightly wrapping a rubber band around the other end. Flip through the side with the drawings to see the life cycle of a frog.

OUTSIDE—Routinely visit a water area (an outside water feature or a pond/puddle, etc.) where the children can observe the metamorphosis of frogs and/or toads.

WRITING—Put out small blank books for the children to write "All About" books on the frog or toad life cycle. Be sure to include colored pencils or markers for illustrating.

SOME HAVE LONG LEGS

CHILDREN COMPLETING THIS LEARNING EXPERIENCE WILL

- Discuss and compare the similarities and differences between frogs and toads
- Sing a song comparing frogs and toads
- Draw frogs and toads

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs~~, ~~beaks~~, appendages, body covering)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)

MATERIALS

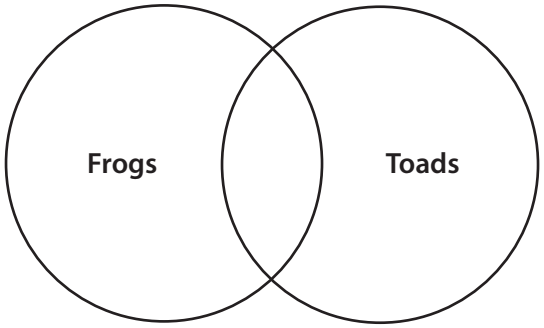
- Frogs and toads flannelboard story
- Flannelboard
- Pictures of frogs and toads
- Chart paper
- Marker
- Science notebook pages
- Colored pencils

TEACHER PREPARATION

- Gather materials
- Become familiar with the song
- Make copies of science notebook pages (one per child)

See "Children's Literature Recommended in Activities" beginning on page 199.

- Prepare 1 piece of chart paper with the following Venn diagram:



PROCEDURE

1. Gather children outside and remind them of the story about the life cycle of frogs and toads.
2. Retell the story using the flannelboard pieces.

3. After retelling the story, talk with children about similarities and differences between frogs and toads that were depicted in the story. Record their ideas on the Venn diagram. Be sure to include information about the life cycles, physical structures, habitat, food, etc. of both frogs and toads. Refer to the frog and toad poster or pictures throughout this process to assist in pointing out differences and similarities.
4. Once their list is complete, teach children the following song to the tune of *Freré Jacques*:

Frogs and toads
Frogs and toads
Toads and frogs
Toads and frogs
Frogs have long legs *(place hands far apart)*
Toads have short legs *(place hands close together)*
Frogs go jump *(make hands jump high)*
Toads go hop *(hop hands just a little)*

5. After the children have sung the song, distribute the science notebook pages and challenge the children to draw a frog and a toad, noting the similarities and labeling the differences.

QUESTIONS FOR DISCUSSION

- How do you tell a frog from a toad?
- How are frogs and toads alike? Different?

ASSESSMENT

Discussion Similarities	Suggested 3–4 similarities between frogs and toads	Suggested 1–2 similarities between frogs and toads
Discussion Differences	Suggested 2–3 differences between frogs and toads	Suggested 1 difference between frogs and toads
Drawing Differences	Drawings with labels accurately identified 2 or more ways that frogs and toads are different	Drawings with labels accurately identified 1 way that frogs and toads are different
Writing Similarities	Writing accurately identified 2 ways that frogs and toads are similar	Writing accurately identified 1 way that frogs and toads are similar

LEARNING CENTER ACTIVITIES

GROUP—Listen to the CD of frog and toad calls from the Missouri Department of Conservation.

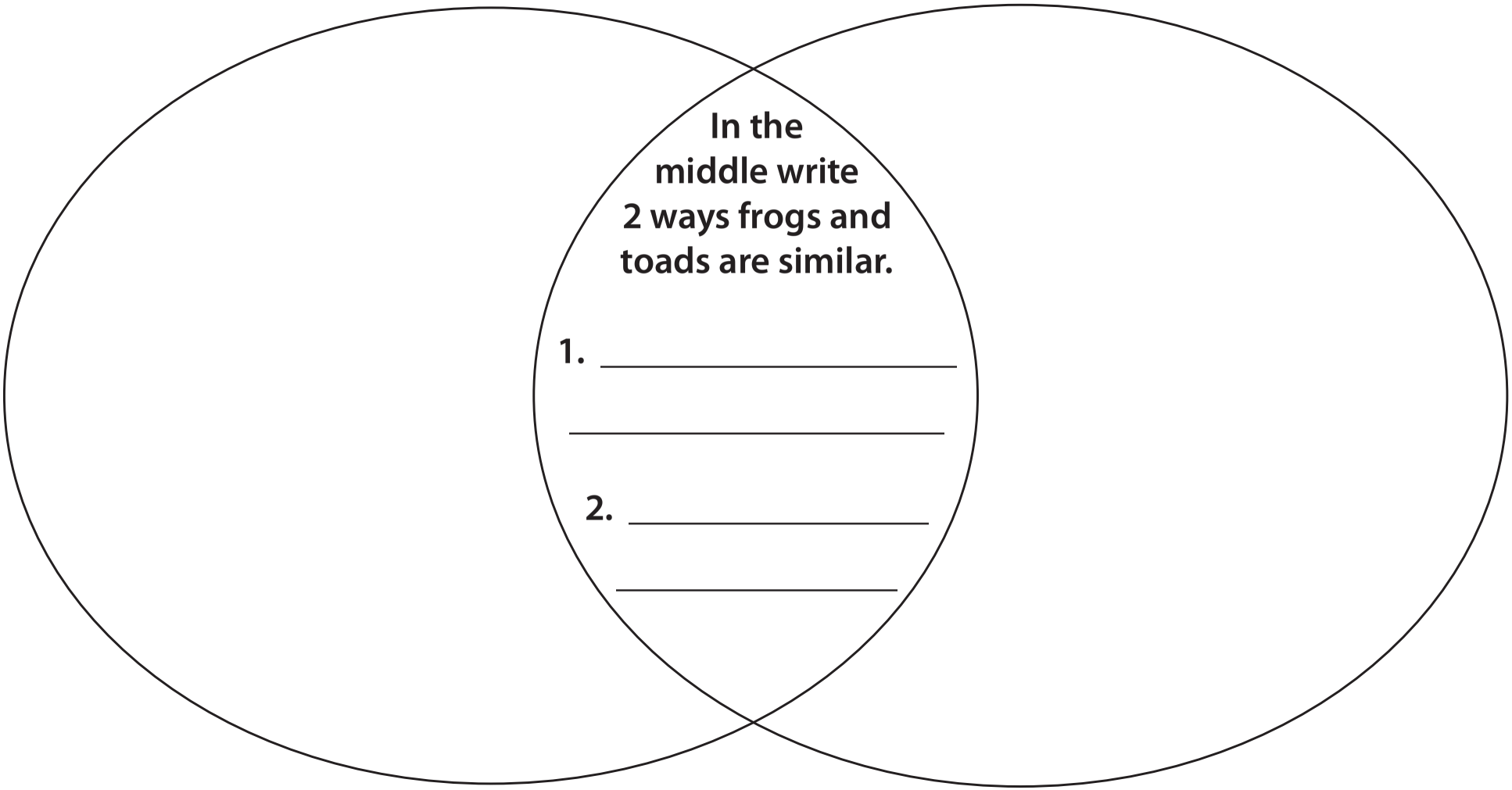
MATH/MANIPULATIVE—Cut out frogs and toads from the "Toads and Frogs of Missouri" poster from the Missouri Department of Conservation. Laminate or cover the frogs and toads with clear contact paper. Place the frogs and toads in a learning center and encourage children to sort them by whether they are frogs or toads.

OUTSIDE—Release some frogs and toads on the outdoor play area and have frog and toad races. Encourage children to observe how the frogs and toads move. Challenge children to move like the frogs or toads once they have observed them. Be sure to release the frogs and toads in their natural habitat before the end of the day.

SOME HAVE LONG LEGS

Draw a frog in this circle.
Label parts on the frog that are different than the toad.

Draw a toad in this circle.
Label parts on the toad that are different than the frog.



PARENTS AND OFFSPRING

CHILDREN PARTICIPATING IN THE LEARNING EXPERIENCE WILL

- Discuss similarities and differences between various living things and their offspring
- Match offspring with parents

GLES ADDRESSED

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences
LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring
LO.3.D.3.a Identify and relate the similarities and differences between plants and their offspring (i.e. seedlings)

MATERIALS

- Adult/offspring animal cards and mature/seedling plant cards
- Pictures of some or all of the children and one of their parents
- Chart paper
- Marker
- Children's copies of *See How The Turkey Grows*

TEACHER PREPARATION

- Send home a note asking parents to send pictures of the children and one or more of their parents
- Sort adult and offspring from the animal cards and mature plants and seedlings from the plant cards
- Divide one piece of chart paper in half, labeling one side "Alike" and the other side "Different"

PROCEDURE

1. Gather children together along with the photographs they have brought from home. Go through photographs matching children with their parents. Note physical similarities and differences between individual children and their moms or dads—eye color, hair color, skin tone, physical features, etc.
2. Talk about ways human children are like their parents and also ways that they are different. Write their ideas on the chart paper.
3. Look through *See How the Turkey Grows* and identify animal parents and offspring and mature plants and seedlings throughout the illustrations in the book.
4. Challenge children to match adult animal and offspring cards and mature plant and seedling cards during center time. Allow children to work with cards during centers.

QUESTIONS FOR DISCUSSION

- How are you like your mom or dad? How are you different?
- How are plant/animal offspring like their parents? How are they different?
- How can you tell which offspring belong to which parents?

ASSESSMENT

Discussion Identifying Similarities	Suggested 4 or more similarities between human parents and their offspring	Suggested 2–3 similarities between human parents and their offspring	Suggested 1 similarity between human parents and their offspring
Discussion Identifying Differences	Suggested 4 or more differences between human parents and their offspring	Suggested 2–3 differences between human parents and their offspring	Suggested 1 difference between human parents and their offspring
Adult and Offspring Matching	Accurately matched 5 of the offspring with the adults	Accurately matched 3 or 4 of the offspring with the adults	Accurately matched 1 or 2 of the offspring with the adults

LEARNING CENTERS

BULLETIN BOARD—Display photographs of various offspring along with parents.

GROUP—During group discussion, stress how parents in the wild care for their young. A baby bird out of the nest will still be cared for by its parents and doesn't need human assistance. Young wild animals should always be left in the wild as their parents are probably close by.

MATH/MANIPULATIVE—Use pictures of children and their parents to create a matching or memory game unique to your classroom.

MATH/MANIPULATIVE—Once children can match offspring with parent, use the cards as a memory game.

HOW DO YOU USE YOUR SENSES?

CHILDREN PARTICIPATING IN THE LEARNING EXPERIENCE WILL

- Experiment with various types of sensory input
- Label structures of animals that are used to see, hear, touch and smell
- Identify ways seeing, hearing, feeling and smelling help animals survive

GLES ADDRESSED

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of plants and animals
LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., sensory organs, ~~beaks~~, ~~appendages~~, ~~body covering~~) (Do NOT assess terms: sensory organs, appendages)
LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (~~e.g., taking in water, support, movement~~, obtaining food, reproduction)

MATERIALS

- Empty film canisters (at least 16)
- Selection of fragrances (choose scents that are pleasant to children)
- Selection of objects to place in canisters and produce distinct sounds
- Hand lenses
- Natural objects to examine with hand lenses (at least four)
- Natural tactile objects (at least four)
- "Feely boxes" (Ex. shoeboxes with lids—at least four)
- Science notebook pages
- Colored pencils
- 4 pieces of chart paper
- Marker
- Children's copies of *See How the Turkey Grows*

TEACHER PREPARATION

- Scent—Prepare a set of 8 film canisters. This will provide enough canisters for 2 each of 4 different scents. Liquid scents like vanilla, vinegar, mint, lemon, etc. can be poured on to cotton balls and then placed in the canisters. Poke small holes in the lids. Once scents are in canisters, secure the lids.
- Sound—Prepare a set of 8 film canisters. Two canisters should be prepared for each sound and a minimum of 4 different sounds should be used. Place objects inside each pair of canisters that produce distinctly different sounds when shaken. Objects for sound could include marbles, dry rice, paper clips, pennies, etc.
- Gather at least 4 natural objects that when closely examined with a hand lens show detail not visible to the naked eye. This might include a cockle burr, butterfly wing, rock, leaf, etc.
- Gather at least 4 natural tactile objects—prickly, smooth, rough, stiff, jagged, hard, hairy, sticky, etc.
- Prepare a "feely box" for each tactile object. Cut a small hand-sized hole in the end of a shoebox. This allows the child to reach in and feel an object without looking at the object. Place one tactile object inside each box.
- Set up a learning center for each sense. Sight—hand lenses with 4 objects; Sound—4 sets of sound canisters; Touch—4 "feely boxes" and Smell—4 sets of scent canisters. Place appropriate science notebook pages in each center.
- Label 1 piece of chart paper for each center—"Sight," "Hearing," "Touch" and "Smell"
- Make copies of science notebook pages (one per child)

PROCEDURE

1. Place materials in learning centers and walk children through the expectations at each center.
    - Sight—Examine each of the objects using a hand lens. Draw a picture of an animal that uses sight to help it survive. Label the part of the animal that helps it see and write about how sight helps the animal survive.

- Sound—Match the film canisters that sound the same. Draw a picture of an animal that relies on its hearing to survive. Label the part of the animal that it uses to hear. Write about how the animal uses hearing to help it survive.
- Touch—Try out each of the "feely boxes" without peeking. Draw a picture of an animal that relies on touch to help it survive. Label the part of the animal that it uses to feel. Write about how the sense of touch helps the animal survive.
- Smell—Match the film canisters that smell the same. Draw a picture of an animal that relies on smell to help it survive. Label the structure the animal uses to smell. Write about how the sense of smell helps the animal survive.

2. Once children have visited all of the centers (the time frame for this might be as short as one day or as long as a week), bring them together to discuss the various learning centers.
3. Talk with them about each of the senses, asking about the animals that they drew under each sense. Record their animals on the chart paper as well as their explanation about how the animal uses the sense to survive.

QUESTIONS FOR DISCUSSION

- What senses do people use the most?
- Which sense do you think is most important to help people survive? Why?
- What animal did you select for …(sight, hearing, touch, smell)? How does this sense help this animal survive?
- How do people know the most important senses for animals?
- How are animals in *See How the Turkey Grows* using their senses?

ASSESSMENT

Science Notebook Sight—Drawing	Animal drawn relies on sense of sight for survival	Animal drawn does not rely on sense of sight for survival
Science Notebook Sight—Labeling	Animal eyes identified as structure that animal uses to see	Animal sight structure either not labeled or inaccurately labeled
Science Notebook Sight—Writing	Accurately identified 2 or more ways animal uses sight for survival	Accurately identified 1 way animal uses sight for survival
Science Notebook Hearing—Drawing	Animal drawn relies on sense of hearing for survival	Animal drawn does not rely on sense of hearing for survival
Science Notebook Hearing—Labeling	Appropriate structure that animal uses to hear is accurately identified	Animal hearing structure either not labeled or inaccurately labeled
Science Notebook Hearing—Writing	Accurately identified 2 or more ways animal uses hearing for survival	Accurately identified 1 way animal uses hearing for survival
Science Notebook Feeling—Drawing	Animal drawn relies on sense of touch for survival	Animal drawn does not rely on sense of touch for survival
Science Notebook Feeling—Labeling	Accurately identified structure animal uses to touch or "feel"	Animal "feeling" structure either not labeled or inaccurately labeled
Science Notebook Feeling—Writing	Accurately identified 2 or more ways animal uses sense of touch for survival	Accurately identified 1 way animal uses sense of touch for survival
Science Notebook Smelling—Drawing	Animal drawn relies on sense of smell for survival	Animal drawn does not rely on sense of smell for survival
Science Notebook Smelling—Labeling	Accurately identified structure animal uses to smell	Animal smell structure either not labeled or inaccurately labeled
Science Notebook Smelling—Writing	Accurately identified 2 or more ways animal uses smell for survival	Accurately identified 1 way animal uses sight for survival

LEARNING CENTER ACTIVITIES

MATH/MANIPULATIVE—Chart the various families of animals (mammals, amphibians, reptiles, birds, insects) represented within the children's drawings. Use the chart to help the class ascertain if they think a particular family of animals relies on one sense more than others.

MATH/MANIPULATIVES—Sort animal cards by the sense each relies upon the most.

NUTRITION—Encourage children to close their eyes eating snack or lunch. Talk about what they think snack might be from the smell.

OUTSIDE—Challenge children to move through the outdoor area relying heavily on one particular sense.

- Smell—Prepare an area by spraying particular trees throughout the play area with diluted vanilla water. Hide small plastic bugs or animals in the leaf litter beneath the sprayed trees. Before bringing the children outside, have them smell some diluted vanilla water. Tell them they are the predators and this is what their prey smells like. Once outside, challenge children to find their prey by smell.
- Hearing—Use the songbird CD available from the Missouri Department of Conservation. Play the songs of 2 or 3 birds routinely seen in the outdoor classroom. Challenge the children to find the birds that sing these songs.
- Touch—Assign children particular textures to find during a classroom walk. Take photographs or collect samples of the various textures.
- Sight—Assign children particular colors or shapes to locate during a routine walk through an area. Take photographs or collect samples of the colors or shapes.

HOW DO YOU USE YOUR SENSES? —SIGHT

Draw an animal that uses its sense of sight to help it survive. Label the part of the animal that it uses to see.

How does this animal use its sense of sight to survive?

HOW DO YOU USE YOUR SENSES? —HEARING

Draw an animal that uses its sense of hearing to help it survive. Label the part of the animal that it uses to hear.

How does this animal use its sense of hearing to survive?

HOW DO YOU USE YOUR SENSES? —TOUCH

Draw an animal that uses its sense of touch to help it survive. Label the part of the animal that it uses to feel.

How does this animal use its sense of touch to survive?

HOW DO YOU USE YOUR SENSES? —SMELL

Draw an animal that uses its sense of smell to help it survive. Label the part of the animal that it uses to smell.

How does this animal use its sense of smell to survive?

LIFE CYCLE RUMMY

CHILDREN PARTICIPATING IN THE LEARNING EXPERIENCE WILL

- Play a game sorting pictures of animals into their various life cycles
- Put photographs of animal life cycles in order

GLES ADDRESSED

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., butterfly, frog, chicken, snake, dog)

MATERIALS

- Animal life cycle cards

TEACHER PREPARATION

- Laminate or cover the life cycle cards with clear contact paper

PROCEDURE

1. Working with a small group of children (3 or fewer), shuffle the life cycle cards and deal each child 5 cards. Place the remaining cards face down on the table between the children.
2. The object of the game is to collect the 4 cards in a life cycle sequence and place them in life cycle sequence on the table.
3. The player taking the first turn does one of two things: draws a card from the deck or draws a card from the hand of the player to his/her right. If he/she has a life cycle sequence, those are then placed on the table. If not, play moves on to the next player to his/her left.
4. Play continues until all life cycles have been placed on the table.

QUESTIONS FOR DISCUSSION

- How do you know which life cycle cards go together?
- How do you decide whether to draw a card or take one from your friend?
- How do you know the sequence of an animal's life cycle?

ASSESSMENT

Game	Actively participated in the game and followed the rules	Actively participated in the game but changed some of the rules to suit individual purposes	Showed little interest in participating in the game
Life Cycle Collection	Accurately collected life cycle cards that belonged to the same life cycle	Collected some of the cards belonging to a particular life cycle	Cards collected were not based upon life cycle categories
Life Cycle Sequencing	Accurately placed 3 or more sets of life cycle cards (butterfly, turkey, snake, frog, fox) in sequential order	Accurately placed 2 or more sets of life cycle cards (butterfly, turkey, snake, frog, fox) in sequential order	Accurately placed 1 set of life cycle cards (butterfly, turkey, snake, frog, fox) in sequential order

LEARNING CENTER ACTIVITIES

SCIENCE—Place life cycle cards in area so children can work together to put them in order.

WRITING—Challenge children to create "All About Books" depicting life cycles of other plants or animals.

CHILDREN'S LITERATURE RECOMMENDED IN ACTIVITIES

SUMMER

GROWING FLOWERS FROM SEEDS

Gibbons, Gail. 1991. *From Seed to Plant*. New York: Holiday House. This simple nonfiction text illustrates the parts of a plant as well as what plants need to grow and reproduce.

Bjork, Christina and Lena Anderson. 1978. *Linnea's Windowsill Garden*. New York: R&S Books. In this reference book Linnea describes how to care for plants throughout this book. In addition to helpful tips for planting and watering, Linnea provides a guide for figuring out what is wrong with plants that don't thrive. This is not a book to be read in one sitting but rather a child centered reference guide to assist young gardeners.

SEE HOW THE TURKEY GROWS

Arnosky, Jim. 1998. *All About Turkeys*. New York: Scholastic Inc. This nonfiction book describes the characteristics, habitat and habits of the wild turkey.

OUTDOOR INVESTIGATION

Morrison, Gordon. 2004. *Nature in the Neighborhood*. New York: Houghton Mifflin Company. This lengthy but well-illustrated seasonal picture book offers many opportunities to view nature in an urban setting. Neighborhood maps are included as well as asides identifying plants and creatures, habitat needs and labels of land features. There are many opportunities throughout the story to point out man-made objects and natural phenomena.

Baker, Jeannie. 1991. *Window*. New York: Greenwillow Books. This wordless picture book uses collage constructions to illustrate how the neighborhood view from a boy's window changes as he grows up. There are many opportunities to distinguish between man-made objects and those created in nature as well as man-made changes to the landscape over time.

SUMMER TREE PORTRAITS

Gibbons, Gail. 2002. *Tell Me, Tree: All About Trees For Kids*. Boston, MA: Little, Brown and Company. This nonfiction book illustrates the parts of a tree as well how to identify various types of trees by both their leaf and bark. Gibbons also addresses how people use trees.

Oppenheim, Joanne. 1967. *Have You Seen Trees?* New York: Scholastic Inc. This short picture book includes illustrations and references to ways people use trees throughout the seasons. The back of the book includes a brief tree identification guide.

WHAT HAPPENS IN THE SUMMER?

Burton, Virginia Lee. 1969. *The Little House*. Boston, MA: Houghton Mifflin Company. This Caldecott award winning book illustrates a little house and people using the land throughout the seasons and a lifetime.

Provensen, Alice and Martin Provensen. 1978. *The Year at Maple Hill Farm*. New York: Aladdin Paperbacks. Farm life for both people and animals is depicted throughout this seasonal picture book.

MEASURING THE RAIN

Serfozo, Mary. 1990. *Rain Talk*. New York: Macmillan. Many words to describe the sound rain makes are introduced in this simple story about a little girl enjoying the rain.

HOW STRONG IS THE WIND?

Bauer, Marion Dane. 2003. *Wind*. New York: Aladdin Paperbacks. Wind and what causes it is explained and illustrated throughout this nonfiction text. The helpful and destructive qualities of the wind are also discussed.

Hutchins, Pat. 1974. *The Wind Blew*. New York: Aladdin Paperbacks. The wind is personified in this story causing havoc to humans. Children will be reminded of their own experiences with the wind.

CLOUD WATCHING

Rockwell, Anne. 2008. *Clouds*. New York: HarperCollins Publishers. Different types of clouds are described and illustrated in this simple nonfiction text.

Hannah, Julie and Joan Holub. 2006. *The Man Who Named the Clouds*. Morton Grove, IL: Albert Whitman & Company. This longer, nonfiction text includes examples of keeping a weather journal, experiments and weather jokes as well as the story of Luke Howard, the man who names the clouds.

WEATHER OBSERVATION

Gibbons, Gail. 1990. *Weather Words and What They Mean*. New York: Holiday House. In this simple nonfiction text, Gibbons introduces how temperature, air pressure, moisture and wind determine the weather. The weather words illustrated in the text will assist children in being more descriptive of the weather.

HOST A CATERPILLAR

Aston, Dianna Hutts and Sylvia Long. 2011. *A Butterfly Is Patient*. San Francisco, CA: Chronicle Books. Caterpillars and butterflies are beautifully illustrated in this captivating book highlighting butterfly facts as well as the life cycle.

WILDFLOWER COLLECTION

Samson, Suzanne M. 1994. *Fairy Dusters and Blazing Stars: Exploring Wildflowers With Children*. Lanham, MD: Roberts Rinehart Publishers. Many wildflowers are illustrated throughout this book with text and illustrations suggesting reasons for the names.

FALL

PLANT OR ANIMAL

Silver, Donald M. 1993. *One Small Square: Backyard*. New York: McGraw-Hill. Children are encouraged to examine their environment more closely after spending time with this nonfiction book. Plants and animals that might be found in any backyard are described and identified in detail. Experiments and journal entry suggestions are also included.

FALL TREE PORTRAITS

Morrison, Gordon. 2000. *Oak Tree*. New York: Houghton Mifflin Company. The impact of the changing seasons on an oak tree are described and illustrated throughout this book. In addition, Morrison includes asides of creatures interacting with the tree as well as information about tree parts and the life cycle of the tree.

Ehlert, Lois. 1991. *Red Leaf, Yellow Leaf*. Orlando, FL: Harcourt Brace & Company. This story describes a sugar maple tree from the perspective of the child who planted it.

LEAFY DESCRIPTIONS

Maestro, Betsy. 1994. *Why Do Leaves Change Color?* New York: HarperCollins Publishers. This nonfiction text describes why leaves change color as well as providing illustrations of various types of leaves.

TREE PUZZLE

Ward, Jennifer. 2009. *The Busy Tree*. Tarrytown, NY: Marshall Cavendish Corporation. This story uses personification for a tree to show its various parts.

NATURE JAR

Aston, Dianna Hutts and Sylvia Long. 2007. *A Seed is Sleepy*. San Francisco, CA: Chronicle Books. This elegantly designed book introduces children to a vast array of seed and plant facts in a poetic voice.

PLANT AND ANIMAL PRODUCT PUZZLES

dePaola, Tomie. 1991. *Pancakes For Breakfast*. San Diego: Harcourt Brace. All of the preparations, from milking the cow to harvesting the syrup, for making pancakes for breakfast are illustrated in this wordless book.

WHAT HAPPENS IN THE FALL?

Updike, John. 1999. *A Child's Calendar*. New York: Holiday House. A poem for each month of the year illustrates the subtle seasonal changes that occur throughout the seasons.

Ball, Jacqueline A. 1989. *What Can It Be? Riddles About the Seasons*. Englewood Cliffs, NJ: Simon & Schuster. Riddles about natural objects found during each season invite children to predict the illustration and text on the next page.

A FOXY LIFE STORY

Tejima, Keizaburo. 1987. *Fox's Dream*. New York: Philomel Books. A lone, hungry fox travels through a winter landscape and remembers its time as a kit before meeting up with a vixen.

WINTER

WINTER TREE PORTRAITS

Gerber, Carole. 2008. *Winter Trees*. Watertown, MA: Charlesbridge Publishing. Common trees in a snow covered forest are explored by a young boy and his dog using their five senses.

Gibbons, Gail. 1995. *The Reasons for Seasons*. New York: Holiday House. This nonfiction book addresses the reasons seasons change as well as illustrating changing human and animal activity during each of the seasons.

PLANTS AND ANIMALS IN WINTER

Bancroft, Henrietta. 1996 (revised edition). *Animals in Winter*. New York: HarperCollins Publishers. This is a brief, simple introduction to how animals prepare for winter.

George, William T. 1992. *Winter at Long Pond*. New York: William Morrow and Company. A father and son spend a winter day exploring around a pond. They discover evidence of many different animals and how they spend the winter around the pond.

George, Lindsay Barrett. 1995. *In the Snow: Who's Been Here?* New York: Greenwillow Books. Cammy and William hike through the winter woods finding clues to animals that are out and about during the winter. Children become actively engaged trying to figure out what the clues indicate about who's been here.

PREDATOR–PREY

Jenkins, Steve. 1997. *What Do You Do When Something Wants to Eat You?* New York: Houghton Mifflin Company. Jenkins addresses animal defenses in this nonfiction picture book.

WHAT IS SNOW?

Cassino, Mark and Jon Nelson. 2009. *The Story of Snow: The Science of Winter's Wonder*. San Francisco, CA: Chronicle Books. This book features photos of real snow crystals along with an engaging and simple explanation of how snow forms.

CATCH A SNOWFLAKE

Martin, Jacqueline Briggs. 1998. *Snowflake Bentley*. New York: Houghton Mifflin Company. This Caldecott Medal book tells the story of Wilson Bentley and how he photographed snowflakes.

PEOPLE IN WINTER

Rylant, Cynthia. 2008. *Snow*. Orlando, FL: Harcourt, Inc. A young girl, her friend and her grandmother enjoy the many delights a snowy day has to offer.

PICK A BEAK

Collard, Sneed B. III. 2002. *Beaks!* Watertown, MA: Charlesbridge Publishing. This nonfiction book encourages the reader to examine different bird beaks and how birds use them to eat, hunt and gather food. It even includes a "beak-ability" test at the end.

EXPLORE A FEATHER

Mainwaring, Jane. 1989. *My Feather*. New York: Bantam Doubleday Dell. Two children describe and explore the unique qualities of feathers using their sense.

BIRD PUZZLES

Sill, Cathryn. 1991. *About Birds: A Guide for Children*. Atlanta, GA: Peachtree Publishers. This nonfiction picture book offers many facts about birds along with watercolor illustrations of various common birds.

SPRING

WHAT HAPPENS IN THE SPRING?

Sanders, Scott Russell. 1999. *Crawdad Creek*. Washington, D.C.: National Geographic. Children enjoy exploring a creek and its inhabitants throughout the year in this realistic fiction picture book.

Lasky, Kathryn. 1995. *Pond Year*. Cambridge, MA: Candlewick Press. Two young girls explore a pond throughout the four seasons.

WHERE DO ANIMALS GO WHEN IT RAINS?

Arnosky, Jim. 2001. *Rabbits & Raindrops*. New York: Puffin Books. A mother rabbit takes her young out of the nest to explore but their adventures are cut short by a rain shower.

Garelick, May. 1997. *Where Does the Butterfly Go When It Rains?* In this picture book Garelick explores where various animals go when it rains.

SEED COMPARISONS

Jordan, Helene J. 1992. *How a Seed Grows*. New York: HarperCollins Publishers. Various seeds are identified in this book along with what they need to grow. Also included is an identification guide for plant parts.

HOW DOES YOUR GARDEN GROW?

Steele, Mary Q. 1989. *Anna's Garden Songs*. New York: Scholastic Inc. This book includes a collection of 14 poems about garden vegetables and how they grow.

SPRING WILDFLOWER OBSERVATION

Pallotta, Jerry. 1988. *The Flower Alphabet Book*. Watertown, MA: Charlesbridge Publishing. Flowers from A to Z are illustrated in this alphabet book. Each illustration includes some information about the flower with further notes in the back of the book.

WHAT HATCHES FROM AN EGG?

Heller, Ruth. 1999. *Chickens Aren't the Only Ones*. New York: Penguin Putnam Books. Children will learn all about animals who are oviparous in this nonfiction picture book.

Aston, Dianna and Sylvia Long. 2006. *An Egg is Quiet*. San Francisco, CA: Chronicle Books. This book introduces the reader to more than 60 types of eggs while poetically relaying numerous egg facts.

FROGS AND TOADS

Parker, Steve. 1999. *It's a Frog's Life*. Pleasantville, NY: Reader's Digest Children's Books. Children will appreciate the unique frog's eye view of life in this frog's journal of froggy life throughout the year.

Llewellyn, Claire. 2003. *Starting Life: Frog*. Minnetonka, MN: NorthWord Press. The unique graduated page format of this nonfiction book makes it easy for the reader to see the stages of a frog's life at a glance.

SOME HAVE LONG LEGS

Kalman, Bobbie and Tammy Everts. 1994. *Frogs & Toads*. New York: Crabtree Publishing. The behaviors, habits and life cycles of both frogs and toads are explained in this book.

BIBLIOGRAPHY OF CHILDREN'S LITERATURE

CHILDREN'S LITERATURE

The following section contains children's literature, appropriate for classroom use. The literature is arranged by theme or topic according to GLE concepts addressed in *Nature Unfolds*. Both fiction and nonfiction have been included. Criteria for literature selection included realistic portrayal of animals in their natural habitat, accurate and factual information, and relevance to concepts covered in the K–2 GLEs addressed. Literature depicting animals with human characteristics was generally not included. The use of realistic literature for conservation discussions encourages children to develop attitudes and ideas about nature that are based on facts. This is not to say that fiction portraying animals with human characteristics is not appropriate but rather to encourage those sharing that literature to discuss the pretend versus real nature of all stories shared with young children.

ANIMALS & ANIMAL LIFE CYCLES

Animals (includes general information about animals as well as signs and characteristics)

Arnosky, Jim. 2008. *Wild Tracks! A Guide to Nature's Footprints*. New York: Sterling Publishing.

Arnosky, Jim. 2008. *Gobble It Up! A Fun Song About Eating*. New York: Scholastic Inc.

Arnosky, Jim. 2002. *Field Trips: Bug Hunting, Animal Tracking, Bird-Watching, Shore Walking with Jim Arnosky*. New York: HarperCollins Publishers.

Arnosky, Jim. 1989. *Crinkleroot's Book of Animal Tracking*. New York: Bradbury Press.

Bowen, Betsy. 1993. *Tracks in the Wild*. Boston, MA: Houghton Mifflin Company.

Brown, Margaret Wise. 1959. *Nibble Nibble: Poems for Children*. New York: HarperCollins Publishers.

Canizares, Susan and Pamela Chanko. 1998. *Who's Hiding?* New York: Scholastic Inc.

Dendy, Leslie. 1995. *Take-Along Guide: Tracks, Scats and Signs*. Minnetonka, MN: NorthWord Press.

Dewey, Jennifer. 1989. *Can You Find Me? A Book About Animal Camouflage*. New York: Scholastic Inc.

Dorros, Arthur. 1991. *Animal Tracks*. New York: Scholastic Inc.

George, Lindsay Barrett. 1996. *Around the Pond: Who's Been Here?* New York: Greenwillow Books.

George, Lindsay Barrett. 1995. *In the Woods: Who's Been Here?* New York: Greenwillow Books.

George, Lindsay Barrett. 1995. *In the Snow: Who's Been Here?* New York: Greenwillow Books.

Hodgkins, Fran. 2008. *Who's Been Here? A Tale in Tracks.* Down East Books.

Jenkins, Steve. 1997. *What Do You Do When Something Wants to Eat You?* New York: Houghton Mifflin Company.

Kitchen, Bert. 1995. *And So They Build*. Cambridge, MA: Candlewick Press.

Kitchen, Bert. 1994. *Somewhere Today*. Cambridge, MA: Candlewick Press.

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Machotka, Hana. 1991. *What Neat Feet!* New York: Scholastic Inc.

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Singer, Marilyn. 1989. *Turtle in July*. New York: Macmillan.

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Amphibians and Reptiles

Arnosky, Jim. 2004. *All About Lizards*. New York: Scholastic Inc.

Arnosky, Jim. 2004. *Slither and Crawl: Eye to Eye with Reptiles*. New York: Sterling Publishing.

Arnosky, Jim. 2002. *All About Frogs*. New York: Scholastic Inc.

Arnosky, Jim. 2000. *All About Turtles*. New York: Scholastic Inc.

Arnosky, Jim. 1997. *All About Rattlesnakes*. New York: Scholastic Inc.

Bakken, Aimee. 2006. *Uncover a Frog*. Bellevue, WA: Silver Dolphin Books.

Berger, Melvin. 1992. *Look out for Turtles!* New York: HarperCollins Publishers.

Berkes, Marianne. 2000. *Marsh Music*. Minneapolis, MN: Millbrook Press.

Bernhard, Emery. 1995. *Salamanders*. New York: Holiday House.

Brown, Ruth. 1999. *Toad*. New York: Penguin Putnam Books.

Burns, Diane L. 1997. *Take-Along Guide: Frogs, Toads and Turtles*. Minnetonka, MN: NorthWord Press.

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Cole, Joanna. 1981. *A Snake's Body*. New York: Trumpet Club.

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Demuth, Patricia. 1993. *Snakes*. New York: Grosset & Dunlap.

Dussling, Jennifer. 1998. *Eyewitness Readers: Slinky Scaly Snakes!* New York: DK Publishing.

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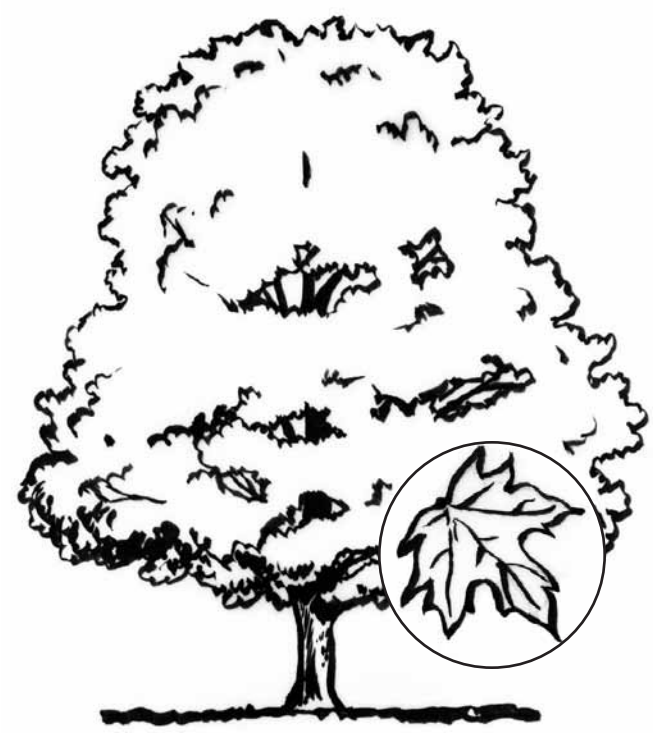

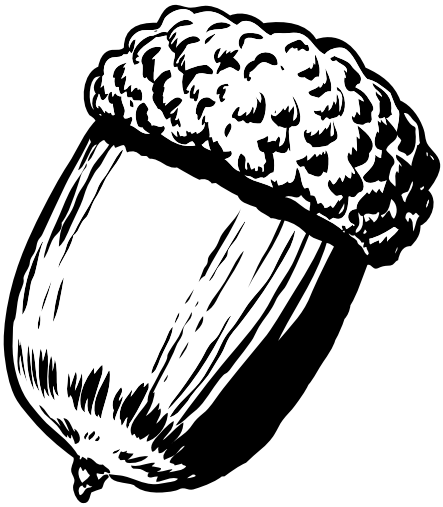

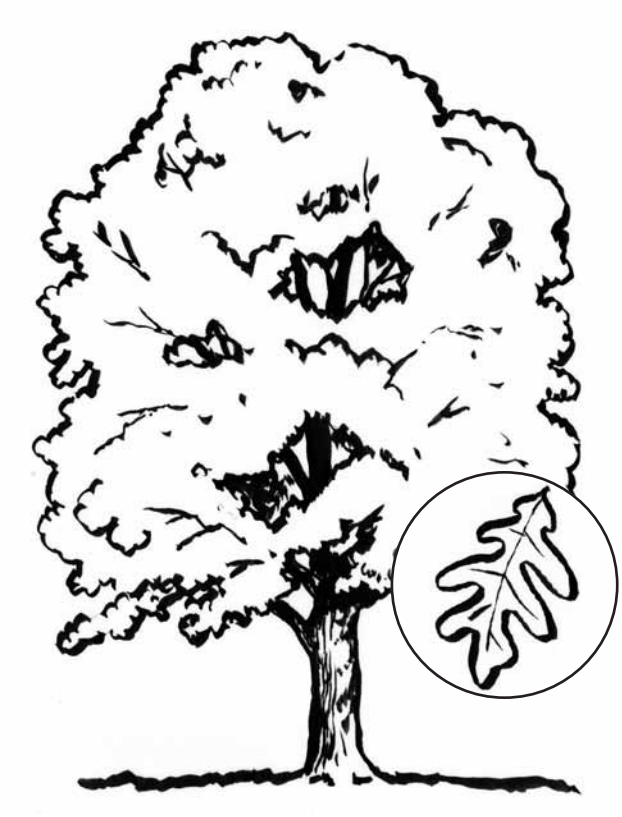

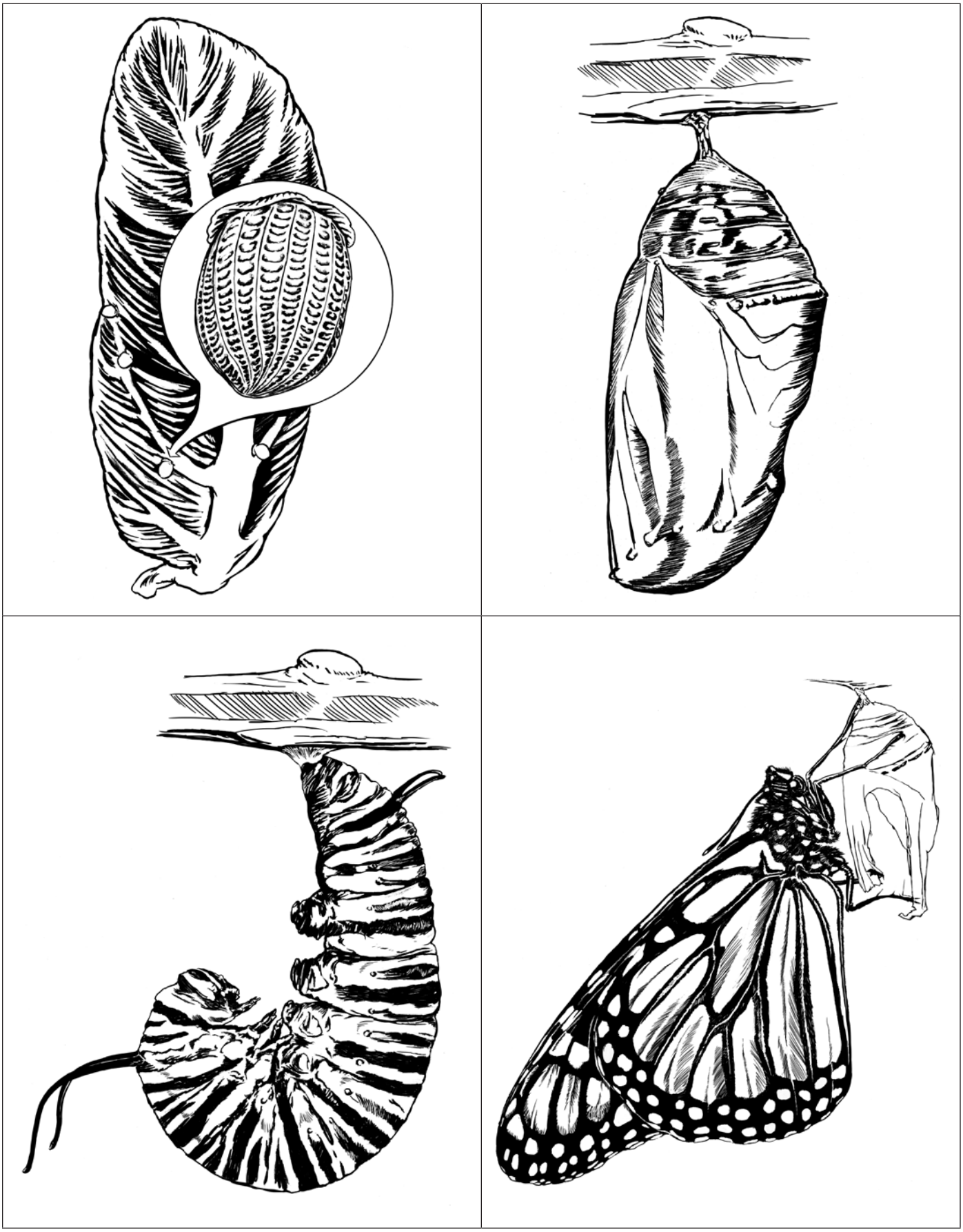

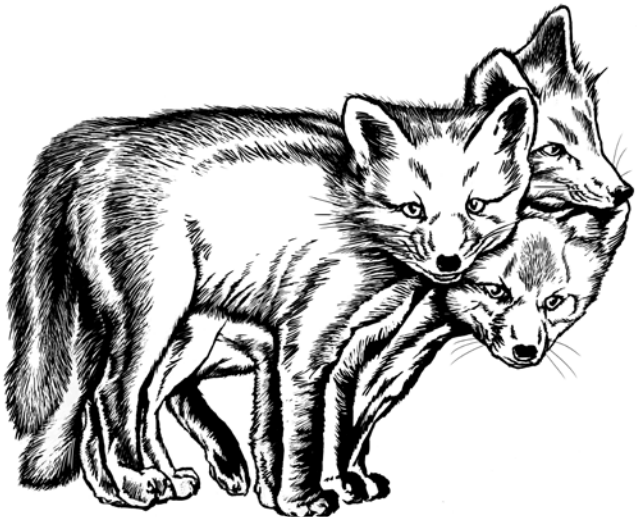

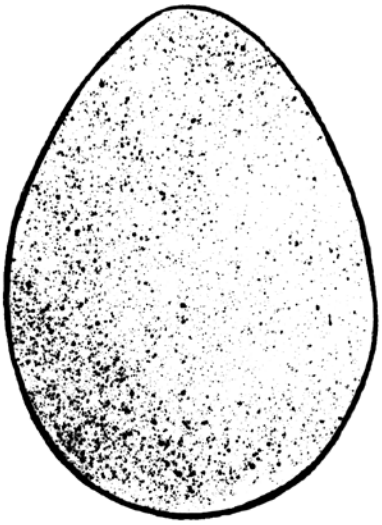

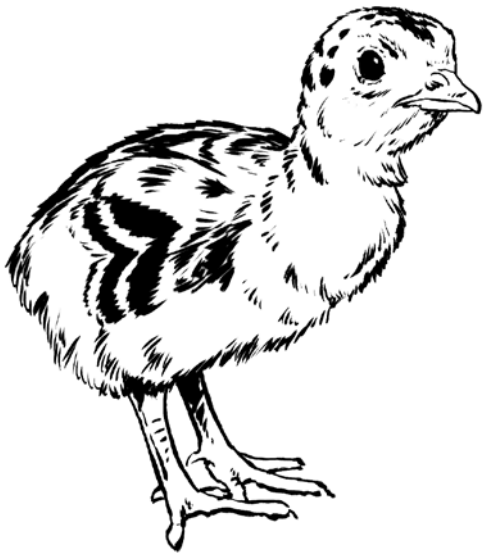

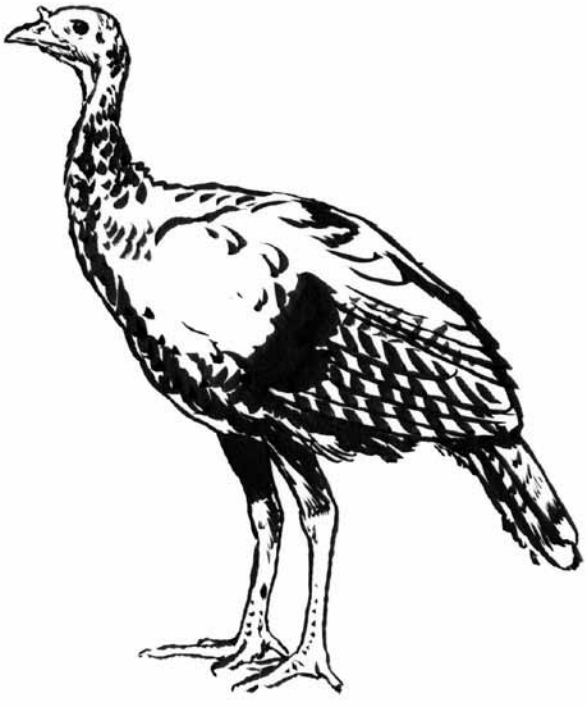

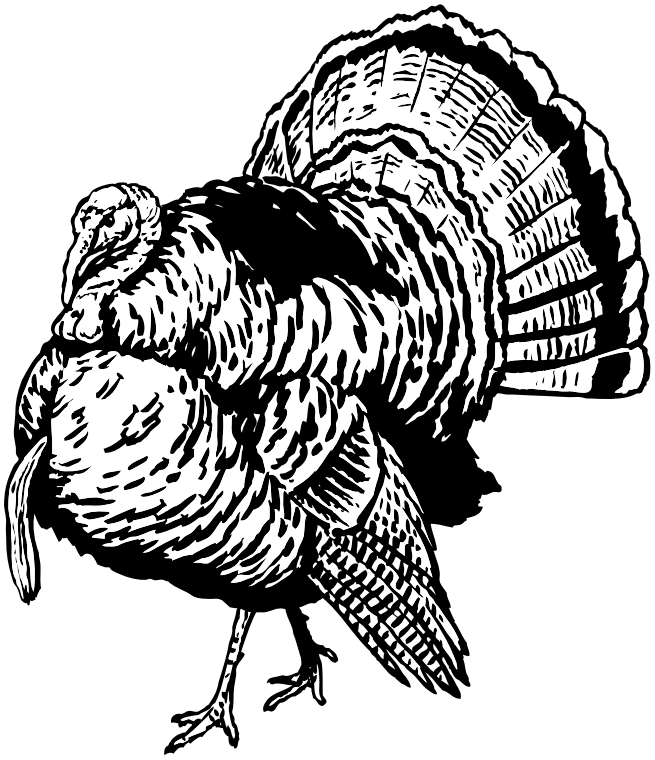

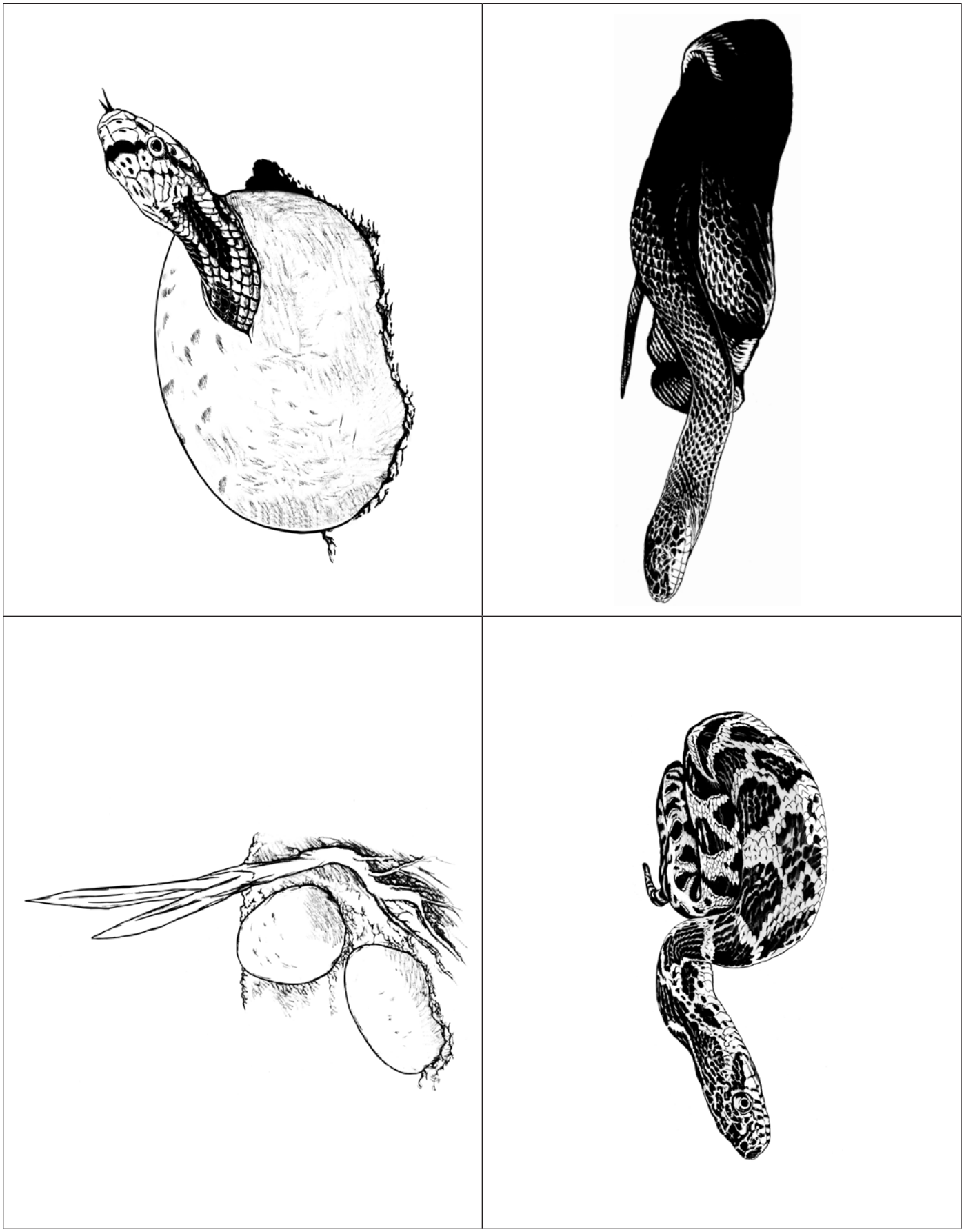

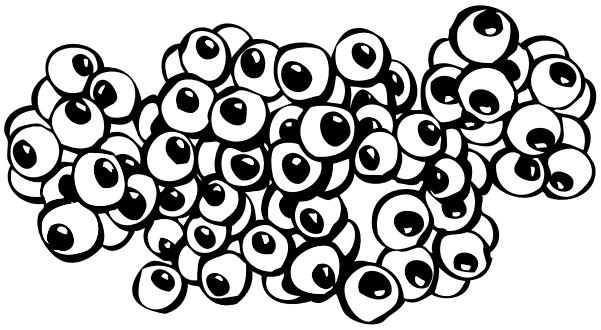

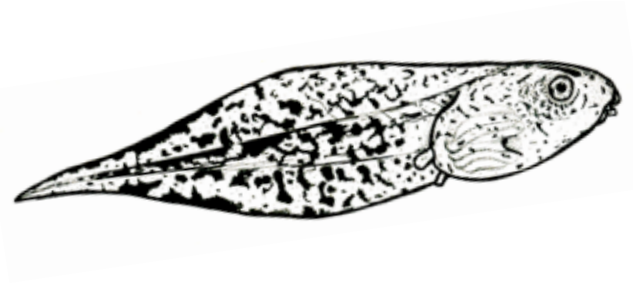

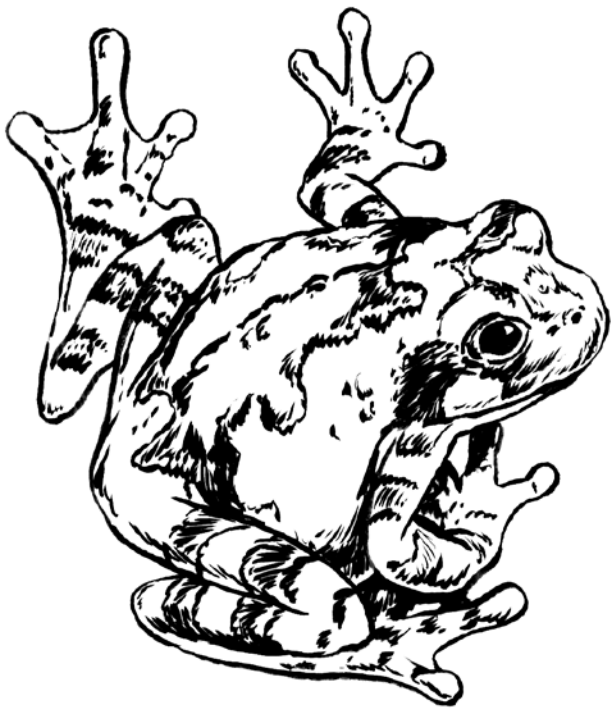

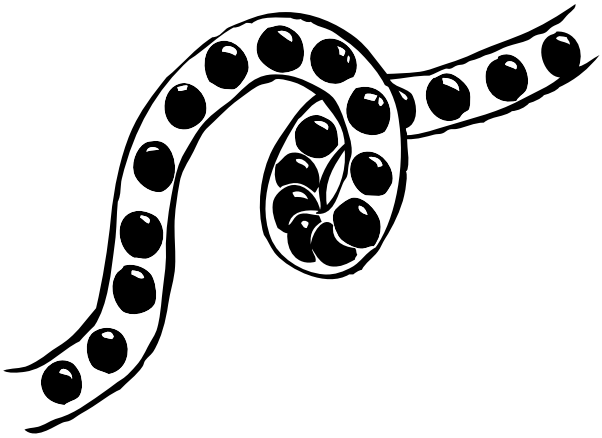

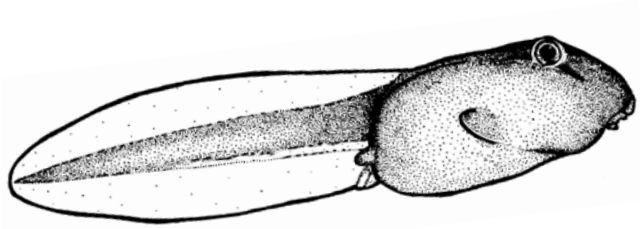

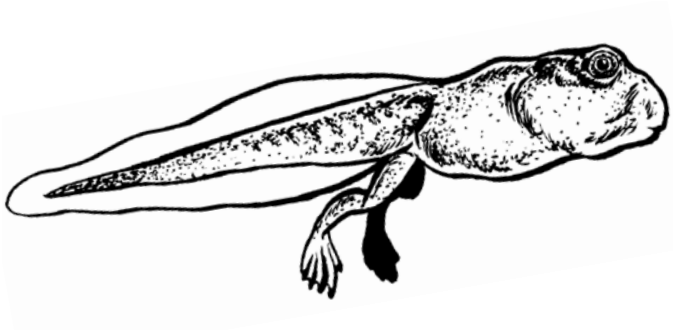

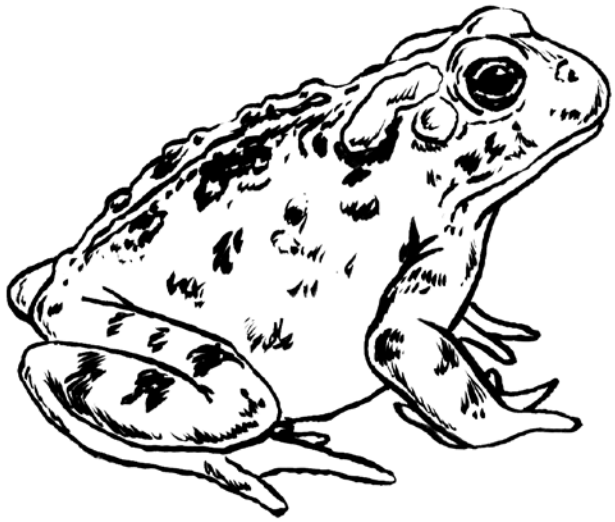

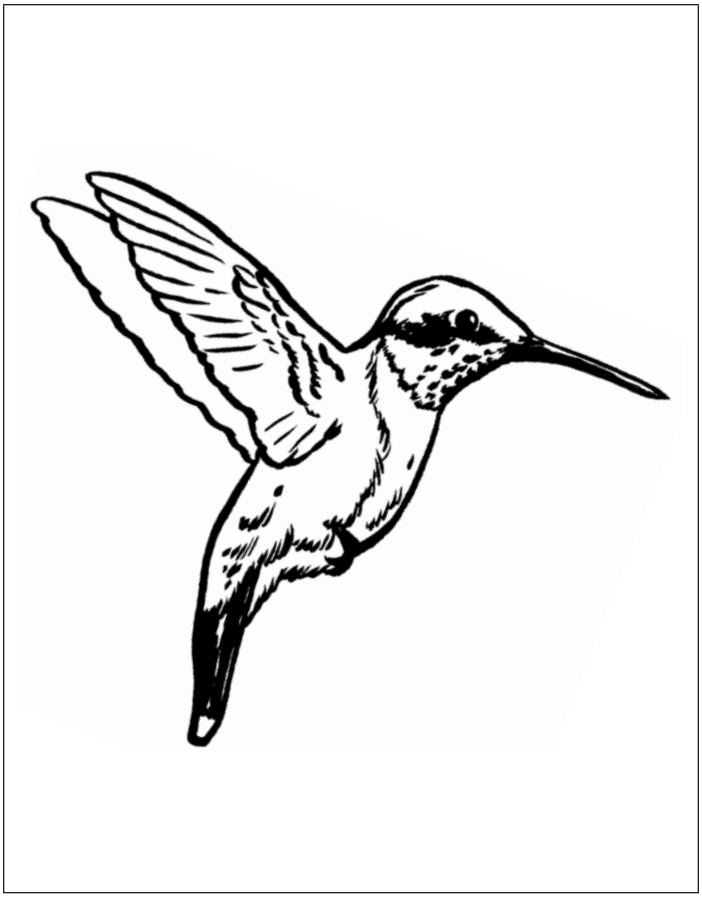

PLANT AND ANIMAL CARD KEY


Sunflower seeds


Sunflower young plant


Sunflower mature plant


Dandelion seeds


Dandelion young plant


Dandelion mature plant


Milkweed seeds


Milkweed young plant


Milkweed mature plant


Sugar maple seeds


Sugar maple seedling


Sugar maple tree

White oak acorn

White oak seedling

White oak tree

Monarch butterfly egg

Monarch butterfly caterpillar

Monarch butterfly pupa

Monarch butterfly

Red fox newborn babies

Red fox kits

Red fox juvenile

Red fox adult

Turkey egg

Turkey chick

Turkey poult

Turkey gobbler (tom)

Black rat snake eggs

Black rat snake hatchling

Black rat snake juvenile

Black rat snake adult

Eastern gray treefrog eggs

Eastern gray treefrog tadpole

Eastern gray treefrog tadpole with legs

Eastern gray treefrog adult

Eastern American toad eggs

Eastern American toad tadpole

Eastern American toad tadpole with legs

Eastern American toad adult

Big brown bat

Hummingbird

MISSOURI SCIENCE GRADE LEVEL EXPECTATIONS (K–3)

MISSOURI DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION (DESE)

SUMMER

GROWING FLOWERS FROM SEEDS

LO.1.A.1.b Identify the basic needs of most plants (i.e., air, water, light)

ME.2.C.1.a Identify light from the sun as a basic need of most plants

LO.1.A.1.c ~~Predict and~~ investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water)

SEE HOW THE TURKEY GROWS

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., ~~butterfly, frog~~, chicken, ~~snake, dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., ~~butterfly, dog, frog~~, chicken, ~~snake~~)

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

OUTDOOR INVESTIGATION

ST.1.A.K-1.a Observe and identify that some objects occur in nature (natural objects); others have been designed and made by people

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings ~~and maps, data tables~~, graphs (bar, ~~pictograph~~), writings

SUMMER TREE PORTRAITS

EC.1.A.1.a Identify ways man depends on plants and animals for food, clothing, and shelter

LO.1.A.1.b Describe the basic needs of most plants (i.e., air, water, light)

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (summer, ~~fall, winter, spring~~)

WHAT HAPPENS IN SUMMER?

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (summer, ~~fall, winter, spring~~)

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

WHAT'S THE TEMPERATURE?

ES.2.F.1.b Compare temperature in different locations (e.g., inside, outside, in the sun, in the shade)

SI.1.B.K-3 Make qualitative observations using the five senses

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., ~~magnifiers/hand lenses, magnets~~, ~~equal arm balances~~, thermometers)

SI.1.B.K-3.d Compare amounts/measurements

MEASURING THE RAIN

ES.2.F.1.a Observe, measure, record weather data throughout the year (i.e., ~~cloud cover, temperature~~, precipitation, ~~wind speed~~) by using ~~thermometers~~, rain gauges, ~~wind socks~~

HOW STRONG IS THE WIND?

ES.1.C.K.a Observe wind as moving air that is felt

ES.2.F.K.a Observe and describe daily weather; ~~precipitation (e.g., snow, rain, sleet, fog)~~, wind ~~(i.e., light breezes to strong wind), cloud cover, temperature~~

CLOUD WATCHING

ES.2.F.K.a Observe and describe daily weather; ~~precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind)~~, cloud cover, ~~temperature~~

ES.2.F.1.d. Identify patterns indicating relationships between observed weather data and weather phenomena (e.g., ~~temperature and types of precipitation~~, clouds and amounts of precipitation)

WEATHER OBSERVATION

ES.2.F.K.a Observe and describe daily weather; precipitation (e.g., snow, rain, sleet, fog), wind (i.e., light breezes to strong wind), cloud cover, temperature

ES.2.F.1.a Observe, measure, record weather data throughout the year (i.e., cloud cover, temperature, precipitation, wind speed) by using thermometers, rain gauges, wind socks

ES.2.F.1.c Compare weather data observed at different times throughout the year (e.g., hot vs. cold, cloudy vs. clear, types of precipitation, windy vs. calm)

ES.2.F.1.d Identify patterns indicating relationships between observed weather data and weather phenomena (e.g., temperature and types of precipitation, clouds and amounts of precipitation)

HOST A CATERPILLAR

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., butterfly, ~~frog, chicken, snake, dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., butterfly, ~~dog, frog, chicken, snake~~)

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

WILDFLOWER COLLECTION

LO.1.D.K.a Observe ~~and compare~~ the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, ~~seeds~~, roots)

FALL

PLANT OR ANIMAL

LO.1.D.K.a Distinguish between plants and animals based on observable structures and behaviors

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings and maps, ~~data tables, graphs (bar, pictograph)~~, writings

FALL TREE PORTRAITS

LO.1.A.1.b Describe the basic needs of most plants (i.e., air, water, light)

EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, fall, ~~winter, spring~~)

LEAFY DESCRIPTIONS

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem~~, leaves, ~~flowers~~, ~~seeds, roots~~)

EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, fall, ~~winter, spring~~)

SI.1.B.K-3.a Make qualitative observations using the five senses

SI.1..B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets~~, ~~equal arm balances, thermometers~~)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

TREE PUZZLE

LO.1.D.K.a Observe ~~and compare~~ the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify ~~and compare~~ the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, reproduction)

HANG ON!

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem, leaves, flowers,~~ ~~seeds~~, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., ~~absorption of water, absorption of light energy~~, support, ~~reproduction~~)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings ~~and maps, data tables, graphs (bar, pictograph)~~, writings

DO TREES GET DRINKS?

LO.1.D.K.a Observe ~~and compare~~ the structures and behaviors of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, ~~leaves, flowers, seeds~~, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, ~~absorption of light energy, support, reproduction~~)

LO.2.C.3.a Illustrate and trace the path of water and nutrients as they move through the transport system of a plant

SI.1.C.K-2.a Use observations as support for reasonable explanations

SI.1.C.K-2.b Use observations to describe relationships and patterns and to make predictions to be tested

SI.1.C.K-2.c Compare explanations with prior knowledge

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings ~~and maps, data tables~~, graphs (bar, pictograph), writings

NATURE JAR

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem, leaves, flowers,~~ seeds, ~~roots~~)

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets, equal arm balances, thermometers~~)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

PLANT AND ANIMAL PRODUCT PUZZLES

EC.1.A.1.a Identify ways man depends on plants and animals for food, clothing, and shelter

WHAT HAPPENS IN THE FALL?

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer~~, fall, ~~winter, spring~~)

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

TURKEY PRINTS

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs, beaks,~~ appendages, ~~body covering~~)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)

A FOXY LIFE STORY

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., ~~butterfly, frog, chicken, snake,~~ dog)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., ~~butterfly~~, dog, ~~frog, chicken, snake~~)

ANIMAL WRAPPERS

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs, beaks, appendages,~~ body covering) (Do NOT assess terms: sensory organs, appendages)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of plants and animals

WINTER

WINTER TREE PORTRAITS

LO.1.A.3.a Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature)

EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

PLANTS AND ANIMALS IN WINTER

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple ~~procedures and~~ results of investigations and explanations through: oral presentations, drawings and maps, ~~data tables, graphs (bar, pictograph),~~ writings

WINTER BRINGS CHANGES

EC.1.A.K.a Describe how the seasons affect the behavior of ~~plants and~~ animals

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

PREDATOR–PREY

LO.1.A.1.a Identify the basic needs of most animals (i.e., ~~air, water~~, food, shelter)

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., ~~taking in water~~, support, movement, obtaining food, ~~reproduction~~)

SI.1.D.1-3.a Communicate simple procedures and results of investigations and explanations through: ~~oral presentations, drawings and maps, data tables~~, graphs (bar, ~~pictograph~~), ~~writings~~

WHAT IS SNOW?

ES.2.E.3.a Describe ~~clouds and~~ precipitation as forms of water

ES.3.F.1.a Observe ~~and describe~~ ways water, both as a solid and liquid is used in everyday activities at different times of the year (e.g., bathe, drink, make ice cubes, build snowmen, cook, swim)

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

SI.1.A.K.b Conduct a simple investigation (fair test) to answer a question

SI.1.A.1-3.b Plan and conduct a simple investigation (fair test) to answer a question

SI.1.D.1-3.a Communicate simple procedures and results of investigations and explanations through: oral presentations, drawings and maps, data tables, graphs (bar, pictograph), writings

CATCH A SNOWFLAKE

UN.2.C.K.a Observe ~~and describe~~ the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

SI.1.B.K-3.a Make qualitative observations using the five senses

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets~~, ~~equal arm balances, thermometers~~)

SI.1.D.K.a Communicate observations using words, pictures, ~~and numbers~~

SI.1.D.1-3.a Communicate simple procedures and results of investigations and explanations through: ~~oral presentations~~, drawings ~~and maps, data tables, graphs (bar, pictograph)~~, writings

WHERE IS IT COLDEST?

ES.2.F.1.b Compare temperature in different locations (e.g., inside, outside, in the sun, in the shade)

SI.1.B.K-3.a Make qualitative observations using the five senses

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., ~~magnifiers/hand lenses, magnets~~, ~~equal arm balances~~, thermometers)

SI.1.B.K-3.d Compare amounts/measurements

HOW DEEP IS THE SNOW?

UN.2.C.K.a Observe ~~and describe~~ the characteristics of the four season as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

SI.1.B.K-3.a Make qualitative observations using the five senses

SI.1.B.K-3.d Compare amounts/measurements

SI.1.D.K.a Communicate observations using words, pictures, and numbers

PEOPLE IN WINTER

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall~~, winter, ~~spring~~)

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

PICK A BEAK

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs~~, beaks, ~~appendages, body covering~~)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., ~~taking in water, support, movement~~, obtaining food, ~~reproduction~~)

EXPLORE A FEATHER

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs, beaks~~, ~~appendages~~, body covering)

SI.1.A.K-3.a Pose questions about objects, materials, organisms, and events in the environment

SI.1.B.K-3.b Make observations using simple tools and equipment (e.g., magnifiers/hand lenses, ~~magnets~~, equal arm balances, ~~thermometers~~)

BIRD PUZZLES

LO.1.A.1.a Identify the basic needs of most animals (i.e., air, water, food, shelter)

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., sensory organs, beaks, appendages, body covering)

SPRING

WHAT HAPPENS IN THE SPRING?

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall, winter~~, spring)

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals.

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

WHERE DO ANIMALS GO WHEN IT RAINS?

EC.1.A.K.a Describe how the seasons affect the behavior of plants and animals

EC.1.A.K.b Describe how the seasons affect the everyday life of humans (e.g., clothing, activities)

SPRING TREE PORTRAITS

LO.1.A.1.b Describe the basic needs of most plants (i.e., air, water, light, nutrients, temperature)

EC.1.A.K.a Describe how the seasons affect the behavior of plants ~~and animals~~

UN.2.C.K.a Observe and describe the characteristics of the four seasons as they cycle through the year (~~summer, fall, winter~~, spring)

SEED COMPARISONS

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., ~~stem, leaves, flowers~~, seeds, ~~roots~~)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., ~~absorption of water, absorption of light energy, support~~, reproduction)

HOW DOES YOUR GARDEN GROW?

ME.2.C.1.a Identify light from the Sun as a basic need of most plants

LO.1.A.1.b Identify the basic needs of most plants (i.e., air, water, light)

LO.1.A.1.c Predict and investigate the growth of plants when growing conditions are altered (e.g., dark vs. light, water vs. no water)

TASTING RADISHES AND LETTUCE

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, ~~flowers~~, ~~seeds~~, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, ~~reproduction~~)

EC.1.A.1.a Identify ways man depends on plants ~~and animals~~ for food, ~~clothing, and shelter~~

SPRING WILDFLOWER OBSERVATION

LO.1.D.K.a Observe and compare the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, ~~seeds~~, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, ~~reproduction~~)

FLOWER PUZZLE

LO.1.D.K.a Observe ~~and compare~~ the structures ~~and behaviors~~ of different kinds of plants ~~and animals~~

LO.1.D.1.a. Identify and compare the physical structures of a variety of plants (e.g., stem, leaves, flowers, seeds, roots)

LO.1.D.1.c Identify the relationships between the physical structures of plants and the function of those structures (e.g., absorption of water, absorption of light energy, support, reproduction)

WHAT HATCHES FROM AN EGG?

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.B.2.a Identify ~~and sequence~~ life cycles (birth, growth, ~~and development~~, reproduction ~~and death~~) of animals (i.e., butterfly, frog, chicken, snake, ~~dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., butterfly, ~~dog~~, frog, chicken, snake)

FROGS AND TOADS

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., ~~butterfly~~, frog, ~~chicken, snake, dog~~)

LO.1.B.2.b Record observations on the life cycle of different animals (e.g., ~~butterfly, dog~~, frog, ~~chicken, snake~~)

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

SOME HAVE LONG LEGS

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of ~~plants and~~ animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., ~~sensory organs, beaks~~, appendages, body covering)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (e.g., taking in water, support, movement, obtaining food, reproduction)

PARENTS AND OFFSPRING

LO.3.D.K.a Identify that living things have offspring based on the organisms' physical similarities and differences

LO.3.D.2.a Identify and relate the similarities and differences among animal parents and their offspring or multiple offspring

LO.3.D.3.a Identify and relate the similarities and differences between plants and their offspring (i.e., seedlings)

HOW DO YOU USE YOUR SENSES?

LO.1.D.K.a Observe and compare the structures and behaviors of different kinds of plants and animals

LO.1.D.1.b Identify and compare the physical structures of a variety of animals (e.g., sensory organs, ~~beaks~~, ~~appendages, body covering~~) (Do NOT assess terms; sensory organs, appendages)

LO.1.D.1.d Identify the relationships between the physical structures of animals and the function of those structures (~~e.g., taking in water, support, movement~~, obtaining food, reproduction)

LIFE CYCLE RUMMY

LO.1.B.2.a Identify and sequence life cycles (birth, growth, and development, reproduction and death) of animals (i.e., butterfly, frog, chicken, snake, dog)